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F. PASCHAL, PRESIDENT.

TRANSACTIONS

OF THE

STATE MEDICAL ASSOCIATION

OF TEXAS

THIRTY-FIFTH ANNUAL SESSION

HELD AT

SAN ANTONIO, TEXAS,

APRIL 28TH, 29TH, 30TH, AND MAY 1ST, 1903.

AUSTIN, TEXAS:
VON BOECKMANN-JONES COMPANY, STATE PRINTERS,
1903.

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NOTE.

The Association does not hold itself responsible for opinions enunciated in papers and discussions herein published. Minutes reported by Dr. Ella Devlin, of Galveston.

H. A. WEST,
Secretary.

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ARTICLES OF INCORPORATION

OF

The State Medical Association of Texas.

Know all men by these presents: That the undersigned have associated themselves and do by these presents associate themselves for the purpose of forming a corporation under the following articles of incorporation:

1. The name of said corporation shall be "State Medical Association of Texas."

2. The purposes for which said corporation is organized are as follows: To organize the regular medical profession of the State of Texas, and to encourage a high standard of professional qualifications and ethics; promote professional brotherhood and advance State medicine, *i. e.,* public hygiene, medical education, medical jurisprudence, and public institutions for the sick and infirm.

3. Said corporation shall transact its business in the State of Texas, and have its principal office and place of business in the city of Austin, Texas.

4. It shall exist for fifty years.

5. Its Board of Directors or Trustees shall consist of five members, and the names and places of residence of those to serve the first year, respectively, are as follows: B. E. Hadra, Dallas, Texas; Taylor Hudson, Belton, Texas; R. F. Miller, Sherman, Texas; H. P. Cooke, Galveston, Texas; H. A. West, Galveston, Texas.

OFFICERS FOR 1903-1904.

PRESIDENT.

FRANK PASCHAL.....San Antonio.

FIRST VICE-PRESIDENT.

F. E. DANIEL.....Austin.

SECOND VICE-PRESIDENT.

A. L. HATHCOCK.....Palestine.

THIRD VICE-PRESIDENT.

JOE BECTON.....Greenville.

SECRETARY.

H. A. WEST.....Galveston.

TREASURER.

R. F. MILLER.....Sherman.

TRUSTEES.

F. D. THOMPSON.....Fort Worth.
J. D. OSBORN.....Cleburne.
WALTER SHROPSHIRE.....Yoakum.
J. B. SHELMIRE.....Dallas.
B. F. KINGSLEY.....San Antonio.

COUNCILORS.

(To serve one year.)

First District.—S. T. TURNER.....El Paso.
Second District.—P. C. COLEMAN.....Colorado.
Third District.—D. R. FLY.....Amarillo.
Fourth District.—C. M. ALEXANDER.....Coleman.
Fifth District.—W. B. RUSS, Secretary.....San Antonio.
Sixth District.—A. E. SPOHN.....Corpus Christi.
Seventh District.—T. J. BENNETT.....Austin.
Eighth District.—WALTER SHROPSHIRE.....Yoakum.

Ninth District.—JOHN T. MOORE, Chairman.....Galveston.
Tenth District.—B. F. CALHOUN.....Beaumont.
Eleventh District.—SAM R. BURROUGHS.....Buffalo.
Twelfth District.—J. J. ROBERT.....Hillsboro.
Thirteenth District.—J. H. MCCRACKEN.....Mineral Wells.
Fourteenth District.—C. E. CANTRELL.....Greenville.
Fifteenth District.—HOLMAN TAYLOR.....Marshall.

ORATOR.

H. A. BARR.....Beaumont.

DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION.

(To be elected by the House of Delegates.)

SECTION OFFICERS.

SECTION ON GENERAL MEDICINE.

WALTER SHROPSHIRE, Chairman.....Yoakum.
W. B. MCKNIGHT, Secretary.....Mansfield.

SECTION ON OBSTETRICS AND DISEASES OF CHILDREN.

JAMES ORR, Chairman.....Terrell.
W. J. POLLARD, Secretary.....Kaufman.

SECTION ON SURGERY.

BACON SAUNDERS, Chairman.....Fort Worth.
E. B. OSBORN, Secretary.....Cleburne.

SECTION ON MEDICAL JURISPRUDENCE.

G. H. MOODY, Chairman.....San Antonio.
T. F. OATES, Secretary.....Mexia.

SECTION ON STATE MEDICINE.

E. E. GUINN, Chairman.....Jacksonville.
A. L. HATHCOCK, Secretary.....Palestine.

SECTION ON GYNECOLOGY.

HUGH CROUSE, Chairman.....Victoria.
W. B. RUSS, Secretary.....San Antonio.

SECTION ON OPHTHALMOLOGY, OTOLOGY, RHINOLOGY AND LARYNGOLOGY.

Jos. MULLEN, Chairman.....Houston.
H. C. HADEN, Secretary.....Galveston.

SECTION ON DERMATOLOGY.

J. B. YORK, Chairman.....Houston.
T. J. PIER, Secretary.....Brenham.

SECTION ON PATHOLOGY.

THOS P. LLOYD, Chairman.....San Antonio.
WM. GAMMON, Secretary.....Galveston.

COMMITTEE ON PUBLIC POLICY AND LEGISLATION.

J. T. WILSON, Chairman.....Sherman.
M. M. SMITH.....Austin.
WALTER SHROPSHIRE.....Yoakum.
FRANK PASCHAL (ex-officio).....San Antonio.
H. A. WEST (ex-officio).....Galveston.

COMMITTEE ON PUBLICATION.

H. A. WEST, Chairman.....Galveston.
HENRY C. HADEN.....Galveston.
J. T. MOORE.....Galveston.

COMMITTEE ON ARRANGEMENTS.

T. J. BENNETT.....Austin.

TIME AND PLACE OF MEETING.

Austin.....Fourth Tuesday in April, 1904.

CONSTITUTION AND BY-LAWS

OF

The State Medical Association of Texas.

[ADOPTED AT SAN ANTONIO, APRIL 29, 1903.]

CONSTITUTION.

ARTICLE I.

NAME OF THE ASSOCIATION.

The name and title of this organization shall be the "STATE MEDICAL ASSOCIATION OF TEXAS."

ARTICLE II.

PURPOSES OF THE ASSOCIATION.

The purposes of this Association shall be to federate and bring into one compact organization the entire medical profession of the State of Texas, and to unite with similar associations in other States to form the American Medical Association, with a view to the extension of medical knowledge, and to the advancement of medical science; to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interests; and to the enlightenment and direction of public opinion in regard to the great problems of State medicine, so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

ARTICLE III.

COMPONENT SOCIETIES.

Component Societies shall consist of those county medical societies which hold charters from this Association.

ARTICLE IV.

COMPOSITION OF THE ASSOCIATION.

SECTION 1. This Association shall consist of members, delegates and guests.

SEC. 2. *Members.*—The members of this Association shall be the members of the component county medical societies.

SEC. 3. *Delegates.*—Delegates shall be those members who are elected in accordance with this Constitution and By-Laws to represent their respective component societies in the House of Delegates of this Association.

SEC. 4. *Guests.*—Any distinguished physician not a resident of this State may become a guest during any annual session upon invitation of the officers of this Association, and shall be accorded the privilege of participating in all of the scientific work for that session.

ARTICLE V.

HOUSE OF DELEGATES.

The House of Delegates shall be the legislative and business body of the Association, and shall consist of (1) delegates elected by the component county societies, (2) the councilors, and (3) ex-officio, the president and secretary of the Association.

ARTICLE VI.

SECTIONS AND DISTRICT SOCIETIES.

The House of Delegates may provide for a division of the scientific work of the Association into appropriate sections, and for the organization of such councilor district societies as will promote the best interests of the profession, such societies to be composed exclusively of members of component county societies.

ARTICLE VII.

SESSIONS AND MEETINGS.

SECTION 1. The Association shall hold an annual session, during which there shall be held daily not less than two general meetings, which shall be open to all registered members, delegates and guests.

SEC. 2. The time and place for holding each annual session shall be fixed by the House of Delegates.

ARTICLE VIII.

OFFICERS.

SECTION 1. The officers of this Association shall be a president, three vice-presidents, a secretary, a treasurer, and fifteen councilors.

SEC. 2. The president and vice-presidents shall be elected for a term of one year. The secretary, treasurer and councilors shall be elected for terms of three years each, the councilors being divided into classes so that three shall be elected each year. All of these officers shall serve until their successors are elected and installed.

SEC. 3. The officers of this Association shall be elected by the House of Delegates on the morning of the last day of the annual session, but no delegate shall be eligible to any office named in the preceding section, except that of councilor, and no person shall be elected to any such office who is not in attendance on that annual session and who has not been a member of the Association for the past two years.

ARTICLE IX.

FUNDS AND EXPENSES.

Funds for meeting the expenses of the Association shall be arranged for by the House of Delegates by an equal per capita assessment upon each county society, to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publications. Funds may be appropriated by the House of Delegates to defray the expenses of the annual sessions, for publication, and for such other purposes as will promote the welfare of the Association and profession.

ARTICLE X.

REFERENDUM.

The general meeting of the Association may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the general meeting, submit any such question to the membership of the Association for a final vote; and if the persons voting shall comprise a majority of all the members, a majority of such vote shall determine the question, and be binding upon the House of Delegates.

ARTICLE XI.

THE SEAL.

The Association shall have a common seal, with power to break, change or renew the same at pleasure.

ARTICLE XII.

AMENDMENTS.

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that annual session; provided, that such amendment shall have been presented in open meeting at the previous annual session, and that it shall have been sent officially to each component county society at least two months before the session at which final action is to be taken.

BY-LAWS.

CHAPTER I.

MEMBERSHIP.

SECTION 1. All members of component societies shall be privileged to attend all meetings and take part in all of the proceedings of the annual sessions, and shall be eligible to any office within the gift of the Association.

SEC. 2. The name of a physician upon the properly certified roster of members, or list of delegates, of a component society which has paid its annual assessment, shall be *prima facie* evidence of his right to register at the annual session in the respective bodies of this Association.

SEC. 3. No person who is under sentence of suspension or expulsion from any component society of this Association, or whose name has been dropped from its roll of members, shall be entitled to any of the rights or benefits of this Association, nor shall he be permitted to take any part in any of its proceedings until such time as he has been relieved of such disability.

SEC. 4. Each member in attendance at the annual session shall enter his name on the registration book, indicating the component society of which he is a member. When his right to membership has been verified by reference to the roster of his society, he shall receive a badge which shall be evidence of his right to all the privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

CHAPTER II.

ANNUAL AND SPECIAL SESSIONS OF THE ASSOCIATION.

SECTION 1. The Association shall hold an annual session at such time and place as has been fixed at the preceding annual session.

SEC. 2. Special sessions of either the Association or of the House of Delegates shall be called by the president at his discretion or upon petition of twenty delegates.

CHAPTER III.

GENERAL MEETINGS.

SECTION 1. The general meetings shall include all registered members, delegates and guests, who shall have equal rights to participate in the proceedings and discussions, and, except guests, to vote on pending questions. Each general meeting shall be presided over by the president, or in his absence or disability, or by his request, by one of the vice-presidents.

Before it, at such time and place as may have been arranged, shall be delivered the annual address of the president and the annual orations, and the entire time of the session so far as may be shall be devoted to papers and discussions relating to scientific medicine.

SEC. 2. The general meeting shall have authority to create committees or commissions for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved of by the House of Delegates.

SEC. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed.

SEC. 4. No address or paper before the Association, except those of the president and orators, shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject.

SEC. 5. All papers read before the society shall be its property. Each paper shall be deposited with the secretary when read.

CHAPTER IV.

HOUSE OF DELEGATES.

SECTION 1. The House of Delegates shall meet annually at 2 p. m. on the day preceding the annual session of the Association, and shall so fix its hours of meeting as not to conflict with the first general meeting of the Association, or with the meeting held for the address of the president and the annual oration, and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with their duties. But if the business interests of the Association and profession require, it may remain in session after the final adjournment of the general meeting. The order of business shall be arranged as a separate section of the program.

SEC. 2. Each component county society shall be entitled to send to the House of Delegates each year one delegate for every 100 members, and one for each fraction thereof, but each county society holding a charter from this Association, which has made its annual report and paid its assessment as provided in this Constitution and By-Laws, shall be entitled to one delegate.

SEC. 3. A majority of the registered delegates shall constitute a quorum, and all of the meetings of the House of Delegates shall be open to members of the Association.

SEC. 4. It shall, through its officers, council and otherwise, give diligent attention to and foster the scientific work and spirit of the Associa-

tion, and shall constantly study and strive to make each annual session a stepping-stone to future ones of higher interest.

SEC. 5. It shall consider and advise as to the material interests of the profession, and of the public in those important matters wherein it is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public health legislation, and to diffuse popular information in relation thereto.

SEC. 6. It shall make careful inquiry into the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing the interest in such county societies as already exist, and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality, and shall continue these efforts until every physician in every county of the State who can be made reputable has been brought under medical society influence.

SEC. 7. It shall encourage post-graduate work in medical centers, as well as home study and research, and shall endeavor to have the results utilized and intelligently discussed in the county societies. With these ends in view, five years after the adoption of these By-Laws no voluntary paper shall be placed upon the annual program or be heard in the Association which has not first been read in the county society of which the author is a member.

SEC. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body in such a manner that not more than one-half of the delegates shall be elected in any one year.

SEC. 9. It shall, upon application, provide and issue charters to county societies organized to conform to the spirit of this Constitution and By-Laws.

SEC. 10. In sparsely settled sections it shall have authority to organize the physicians of two or more counties into societies, to be designated by hyphenating the names of two or more counties so as to distinguish them from district and other classes of societies, and these societies, when organized and chartered, shall be entitled to all the privileges and representation provided herein for county societies, until such counties may be organized separately.

SEC. 11. It shall divide the State into fifteen councilor districts, and, when the best interests of the Association and profession will be promoted thereby, each a district medical society, and all members of component county societies, and no others, shall be members in such district societies. When so organized, from the presidents of such district societies shall be chosen the vice-presidents of this Association, and the presidents of the

county societies of the district shall be the vice-presidents of such district societies.

SEC. 12. It shall have authority to appoint committees for special purposes from among members of the Association who are not members of the House of Delegates, and such committees may report to the House of Delegates in person, and may participate in the debate thereon.

SEC. 13. It shall approve all memorials and resolutions issued in the name of the Association before the same shall become effective.

SEC. 14. It shall present a summary of its proceedings to the last general meeting of each annual session, and shall publish the same.

CHAPTER V.

ELECTION OF OFFICERS.

SECTION 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect.

SEC. 2. The House of Delegates on the first day of the annual session shall select a Committee on Nomination, consisting of five delegates, no two of whom shall be from the same councilor district. It shall be the duty of this committee to consult with the members of the Association and to hold one or more meetings, at which the best interests of the Association and of the profession of the State for the ensuing year shall be carefully considered. The committee shall report the result of its deliberations to the House of Delegates in the shape of a ticket, containing the names of three members for the office of president and of one member for each of the other offices to be filled at that annual session. No two candidates for president shall be named from the same county.

SEC. 3. The report of the Nominating Committee and the election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the last day of the general session.

SEC. 4. Nothing in this article shall be construed to prevent additional nominations being made by members of the House of Delegates.

CHAPTER VI.

DUTIES OF OFFICERS.

SECTION 1. The president shall preside at all meetings of the Association and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver an annual address at such time as may be arranged; shall give a deciding vote in case of a tie, and shall perform such other duties as custom and parliamentary usage may require. He shall be

the real head of the profession of the State during his term of office, and, as far as practicable, shall visit, by appointment, the various sections of the State and assist the councilors in building up the county societies, and in making their work more practical and useful.

SEC. 2. The vice-presidents shall assist the president in the discharge of his duties. In the event of his death, resignation or removal, the council shall select one of the vice-presidents to succeed him.

SEC. 3. The treasurer shall give bond for the trust reposed in him whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the Association, together with the bequests and donations. He shall, under the direction of the House of Delegates, sell or lease any estate belonging to the Association, and execute the necessary papers; and shall, in general, subject to such direction, have the care and management of the fiscal affairs of the Association. He shall pay money out of the treasury only on a written order of the president, countersigned by the secretary; he shall subject his accounts to such examination as the House of Delegates may order, and he shall annually render an account of his doings and of the state of the funds in his hands. He shall charge upon his books the assessments against each component county society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him. The expenses of the treasurer in attending the annual sessions may be paid by the House of Delegates.

SEC. 4. The secretary, acting with the committee on scientific work, shall prepare and issue the programs for and attend all meetings of the Association and of the House of Delegates, and he shall keep minutes of their respective proceedings in separate record books. He shall be custodian of all record books and papers belonging to the Association, except such as properly belong to the treasurer, and shall keep account of and promptly turn over to the treasurer all funds of the Association which come into his hands. He shall provide for the registration of the members and delegates at the annual sessions. He shall keep a card-index register of all the legal practitioners of the State by counties, noting on each his status in relation to his county society, and upon request shall transmit a copy of this list to the American Medical Association for publication. In so far as it is in his power he shall use the printed matter, correspondence and influence of his office to aid the councilors in the organization and improvement of the county societies, and in the extension of the power and usefulness of this Association. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as chairman of the committees on scientific work and on publication. He shall employ such assist-

ants as may be ordered by the council or House of Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the secretary may be enabled to give that amount of time to his duties which will permit of his becoming proficient, it is desirable that he should receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

CHAPTER VII.

COUNCIL.

SECTION 1. The council shall hold daily meetings during the annual session of the Association and at such other times as necessity may require, subject to the call of the chairman or on petition of three councilors. It shall meet on the last day of the annual session of the Association for reorganization and for the outlining of work for the ensuing year. At this meeting it shall elect a chairman and secretary, and the latter shall keep a record of its proceedings. It shall, through its chairman, make an annual report to the House of Delegates at such time as may be provided.

SEC. 2. Each councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession, and for improving and increasing the zeal of the county societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district to each annual session of the House of Delegates. The necessary traveling expenses incurred by such councilor in the line of the duties herein imposed may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expense in attending the annual session of the Association.

SEC. 3. Collectively the council shall be the Board of Censors of the Association. It shall consider all questions involving the rights and standing of members, whether in relation to other members, to the component societies, or to this Association. All questions of an ethical nature brought before the House of Delegates or the general meeting shall be referred to the council without discussion. It shall hear and decide all questions of discipline affecting the conduct of members or of a county society, upon which an appeal is taken from the decision of an individual councilor. Its decision in all such cases shall be final.

SEC. 4. The council shall have the right to communicate the views of the profession and of the Association in regard to health, sanitation and other important matters to the public and the lay press. Such communications shall be officially signed by the chairman and secretary of the council, as such.

CHAPTER VIII.

COMMITTEES.

SECTION 1. The standing committees shall be as follows:

A committee on scientific work.

A committee on public policy and legislation.

A committee on publication.

A committee on nominations.

A committee on arrangements, and such other committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

SEC. 2. The committee on scientific work shall consist of three members, of which the secretary shall be a member and chairman, and shall determine the character and scope of the scientific proceedings of the Association for each session, subject to the instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as practicable.

SEC. 3. The committee on public policy and legislation shall consist of three members and the president and secretary. Under the direction of the House of Delegates it shall represent the Association in securing and enforcing legislation in the interest of the public health and scientific medicine. It shall keep in touch with professional and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and shall utilize every organized influence of the profession to promote the general influence in local, state and national affairs and elections. Its work shall be done with the dignity becoming a great profession and with that wisdom which will make effective its power and influence. It shall have authority to be heard before the entire Association upon questions of great concern at such time as may be arranged during the annual session.

SEC. 4. The committee on publication shall consist of three members, of which the secretary shall be one and chairman, and shall have referred to it all reports on scientific subjects, and all scientific papers and discussions heard before the Association. It shall be empowered to curtail or abstract papers and discussions, and any paper referred to it which may not be suitable for publication may be returned to the author. The committee shall have authority to arrange for the publication and distribution of the Transactions. All papers read before the Association shall be its property.

SEC. 5. The committee on nominations shall be appointed and perform

its duties in accordance with the provisions of Chapter V, Sections 2 and 3 of these By-Laws.

SEC. 6. The committee of arrangements shall consist of the component society in the territory in which the annual session is to be held. It shall, by committees of its own selection, provide suitable accommodations for the meeting-places of the Association and of the House of Delegates, and of their respective committees, and shall have general charge of all the arrangements. Its chairman shall report an outline of the arrangements to the secretary for publication in the program and shall make additional announcements during the session as occasion may require.

CHAPTER IX.

ASSESSMENTS AND EXPENDITURES.

SECTION 1. An assessment of two dollars ($2.00) per capita on the membership of the component societies is hereby made the annual dues of this Association. The secretary of each county society shall forward its assessment together with its roster of all officers and members, list of delegates, and list of non-affiliated physicians of the county to the secretary of this Association ten days in advance of each annual session.

SEC. 2. Any county society which fails to pay its assessment, or make the reports required, on or before the date above stated, shall be held as suspended, and none of its members or delegates shall be permitted to participate in any of the business or proceedings of the Association or of the House of Delegates until such requirements have been met.

SEC. 3. All motions or resolutions appropriating money shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the council and House of Delegates on a call of the ayes and noes.

CHAPTER X.

RULES OF CONDUCT.

The principles of Medical Ethics of the American Medical Association shall govern the conduct of members in their relations to each other and to the public.

CHAPTER XI.

RULES OF ORDER.

The deliberations of this Association shall be governed by parliamentary usage as contained in Roberts's Rules of Order, unless otherwise determined by a vote of its respective bodies.

CHAPTER XII.

COUNTY SOCIETIES.

SECTION 1. All county societies now in affiliation with this Association or those that may hereafter be organized in this State, which have adopted principles of organization not in conflict with this Constitution and By-Laws, shall, upon application to the council, receive a charter from and become a component part of this Association.

SEC. 2. As rapidly as can be done after the adoption of this Constitution and By-Laws, a medical society shall be organized in every county in the State in which no component society exists, and charters shall be issued thereto.

SEC. 3. Charters shall be issued only upon approval of the council or House of Delegates and shall be signed by the president and secretary of this Association. The council or House of Delegates shall have authority to revoke the charter of any component county society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

SEC. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists, friendly overtures and concessions shall be made, with the aid of the councilor for the district if necessary, and all of the members brought into one organization. In case of failure to unite, an appeal may be made to the council, which shall decide what action shall be taken.

SEC. 5. Each county society shall judge of the qualification of its own members, but as such societies are the only portals to this Association and to the American Medical Association, every reputable white and legally registered physician who is practicing, or who will agree to practice, nonsectarian medicine shall be entitled to membership. Before a charter is issued to any county society, full and ample notice and opportunity shall be given to every such physician in the county to become a member.

SEC. 6. Any physician who may feel aggrieved by the action of the society of his county in refusing him membership, or in suspending or expelling him, shall have the right of appeal to the council, which, upon a majority vote, may permit him to become a member of an adjacent county society.

SEC. 7. In hearing appeals the council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a board and as individual councilors in district and county work, efforts at concilliation and compromise shall precede all such hearings.

SEC. 8. When a member in good standing in a component society moves to another county in this State, his name, upon request, shall be transferred

without cost to the roster of the county society into whose jurisdiction he moves.

SEC. 9. A physician living on or near a county line may hold his membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

SEC. 10. Each county society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material condition of every physician in the county; and systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county.

SEC. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original research work, and to give the society the first benefit of such labors. Official position and other preferments shall be unstintingly given to such members.

SEC. 12. At the time of the annual election of officers each county society shall elect a delegate or delegates to represent it in the House of Delegates of this Association, in the proportion of one delegate to each one hundred members or fraction thereof, and the secretary of the society shall send a list of such delegates to the secretary of the Association, at last ten days before the annual sessions.

SEC. 13. The secretary of each county society shall keep a roster of its members and a list of the non-affiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the secretary of this Association, thirty days in advance of each annual session, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster the secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

CHAPTER XIII.

AMENDMENTS.

These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the amendment has laid upon the table for one day.

APPENDIX.

The State shall be divided into the following Councilor Districts, subject to revision by the House of Delegates:

No. 1. El Paso District, composed of all counties west of the Pecos river, together with Loving, Winkler and Ward counties.

No. 2. Big Springs District, embracing the following counties: Crane, Ector, Midland, Glasscock, Howard, Mitchell, Scurry, Kent, Nolan, Taylor, Jones, Haskell, Knox, King, Dickens, Crosby, Lubbock, Hockley, Cochran, Yoakum, Terry, Lynn, Garza, Gaines, Dawson, Borden, Andrews, Martin, Upton, Stonewall and Fisher.

No. 3. Panhandle District, embracing the tier of counties extending east, including Bailey, Lamb, Hale, Floyd, Motley, Cottle, Foard, Hardeman, and all counties north and west of the above tier.

No. 4. San Angelo District, embracing the following counties: Crockett, Sutton, Schleicher, Irion, Tom Green, Sterling, Coke, Runnels, Coleman, Concho, McCulloch, Menard, Kimble and Brown.

No. 5. San Antonio, or Western District, embracing the following counties: Edwards, Kerr, Bandera, Gillespie, Kendall, Bexar, Guadalupe, Wilson, Atascosa, Frio, Uvalde, Zavala, Kinney, Medina, Maverick, Dimmit, La Salle, Karnes, Comal and Val Verde.

No. 6. Corpus Christi or Southwest Texas District, embracing the following counties: Webb, Encinal, Duval, McMullen, Live Oak, Bee, Goliad, Refugio, Aransas, San Patricio, Nueces, Cameron, Hidalgo, Starr and Zapata.

No. 7. Austin District, embracing the following counties: Caldwell, Bastrop, Lee, Williamson, Burnet, Travis, Hays, Blanco, Llano, Mason and San Saba.

No. 8. DeWitt District, embracing the following counties: Gonzales, DeWitt, Victoria, Calhoun, Jackson, Lavaca, Fayette, Colorado, Wharton and Matagorda.

No. 9. South Texas District, embracing the following counties: Brazoria, Fort Bend, Austin, Waller, Montgomery, Harris, Galveston, Chambers and Washington.

No. 10. Southeast Texas District, embracing the following counties: Liberty, San Jacinto, Polk, Tyler, Hardin, Jefferson, Orange, Jasper, Newton, Angelina, Nacogdoches, Shelby, San Augustine and Sabine.

No. 11. Brazos Valley District, embracing the following counties: Brazos, Burleson, Milam, Robertson, Leon, Madison, Grimes, Walker, Houston and Trinity.

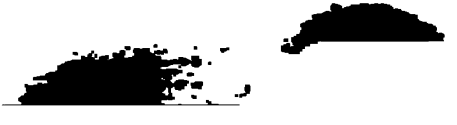
No. 12. Central Texas District, embracing the following counties: Bell,

Lampasas, Mills, Comanche, Hamilton, Coryell, Falls, McLennan, Bosque, Hill, Limestone, Freestone and Navarro.

No. 13. Northwest Texas District, embracing the following counties: Callahan, Shackelford, Throckmorton, Baylor, Wilbarger, Wichita, Archer, Young, Stephens, Eastland, Palo Pinto, Jack and Clay.

No. 14. North Texas District, embracing the following counties: Erath, Hood, Parker, Wise Montague, Cooke, Denton, Tarrant, Johnson, Ellis, Dallas, Collins, Grayson, Fannin, Hunt, Rockwall, Kaufman, Van Zandt, Rains, Hopkins, Delta and Lamar.

No. 15. Northeast District, embracing the following counties: Cherokee, Rusk, Anderson, Panola, Harrison, Gregg, Smith, Wood, Upshur, Marion, Cass, Morris, Titus, Franklin, Red River, Bowie and Camp.



MINUTES

OF THE

THIRTY-FIFTH ANNUAL MEETING

OF THE

STATE MEDICAL ASSOCIATION OF TEXAS,

HELD AT

SAN ANTONIO, TEXAS,

APRIL 28TH, 29TH, 30TH, AND MAY 1ST, 1903.

STATE MEDICAL ASSOCIATION OF TEXAS,

THIRTY-FIFTH ANNUAL MEETING.

FIRST DAY.—*Morning Session.*

TURNER HALL, SAN ANTONIO, April 28, 1903.

The thirty-fifth annual meeting of the State Medical Association was opened in San Antonio, on Tuesday, April 28, 1903, the sessions being held in Turner Hall.

Dr. J. S. Lankford, vice-Chairman of the Committee on Arrangements, having called the Association to order, the following invocation was offered by Rev. Arthur G. Jones, pastor of the First Presbyterian Church, San Antonio.

Almighty God, Maker of our bodies and Father of our spirits, we would pause in the business which is before us to make grateful acknowledgment that every good gift comes down from Thee; that in Thee we live and move and have our being.

We thank Thee for life, for the life of the body and for the life of the soul. We thank Thee, that in Thy grace and mercy, Thou hast made such adequate provision for our recovery from sin, which so sadly mars the health of the soul. We thank Thee for the wonderful provision Thou hast made for the healing of the diseases which distress the life of the body. As there convenes in this place today, gathered from all parts of this great commonwealth, an assembly of men whose vocation is the welfare of the life of the body, we pray Thy divine blessing upon them.

We thank Thee that the old days have passed away. We thank Thee for the progress in science and in the practice of medicine; we thank Thee for our better knowledge of the conditions of disease and the remedies for its relief; we thank Thee for our deeper understanding of the processes of the powers of nature, which Thou Thyself hast appointed to help us in our battle with sickness, so that we have today a more adequate equipment for the alleviation of human suffering.

We thank Thee for this body of men, for the good cause to which they have dedicated their lives, for their intelligence, and for the unfailing spirit of sympathy which they always exhibit toward humanity in distress. We pray Thee to guide them in the deliberations of this assembly so that much may be done which will enlarge their usefulness in the days to come. And

when they return from this place, may they go rejoicing in their work as a divine calling; may they go in the spirit and with the benediction of the great Physician "who forgiveth all our iniquities, who healeth all our diseases, who redeemeth our life from destruction." Do Thou help them and crown their labors with abundant success.

And not unto us, O Lord, not unto us, but unto Thy great name, will we give all the praise and the glory, both now and forever. Amen.

Dr. Lankford then introduced Hon. J. E. Webb, who welcomed the Association, in behalf of the city of San Antonio, in graceful and eloquent terms.

Dr. Lankford then introduced Hon. Wm. Aubrey, who, on behalf of the citizens, welcomed the Association in the following words:

In welcoming you to the City of the Alamo, we do not feel that we are entertaining strangers. Every Texan who knows the history of his State must feel at home in this, its Mother City. Every Texan familiar with the deeds of those who have lived and died here, must regard the scene of their courage and devotion with admiration, if not affection.

The early fathers cast civilization, its comforts and security behind them, and established here the foundations of a new empire. On these foundations, other men of a different race built the enduring structure of Texas liberty and independence. The siege of the Alamo made the rout of San Jacinto possible. Missionary zeal has elsewhere shone with equal brilliancy and effect, but the flood of Anglo-Saxon valor reached its high-water mark here in the humble stone chapel within a stone's throw of us. Never went braver souls more calmly to certain death. Never was human sacrifice attended with more splendid results.

It is because of this history, common to us all, these glories of the past which we share together, and which, though their origin be local, belong to all Texans alike, we bid you remember you are at home.

Aside from these considerations, from that remote time when the pioneers of christianity raised their Master's cross in this wilderness, and bade all men come to rest in its shade, the people of this community have ever greeted those who came to them with warm hearts and open hands. The hospitality of this ancient city, if not proverbial, we may claim, with all fitting modesty, is not wholly unknown.

The city itself is filled with objects of interest, novel and strange, no doubt, to many of you—its venerable missions, its narrow streets with Spanish names, its spacious and beautiful plazas, its massive, thick-walled houses and serpentine river are suggestive of foreign lands. But the genius of our people is wholly American, and their warmest aspirations are for the growth and grandeur of our great State.

We feel that in the aggregate of our future greatness, there will be found no factor more interesting or important than your own profession. We know that the earnestness and intelligence of the profession in Texas, as well as the lofty ideals which they have established, have greatly intensified the respect and admiration of your fellow citizens.

Certainly, the physicians and surgeons of our own community command and deserve our esteem in the highest degree, and no class or condition of men wield a wider influence for good in our midst.

We feel assured that meetings such as these greatly broaden the scope of professional activity, and of necessity redound to the good of the public at large.

Permit us to hope that those who attend this meeting will find their sojourn here as agreeable as I doubt not it will be profitable. Of one fact you may be certain—our people are glad and proud to have you with us.

Dr. Frank Paschal, on behalf of the medical profession of San Antonio, welcomed the Association as follows:

Mr. President, Members of the Texas State Medical Association, and Ladies:

On behalf of the medical profession of this city, I extend to you a cordial welcome. You are always welcome, but at this time, when there will be before you matters of the greatest importance for the welfare of our Association, you are particularly welcome. We feel that you made no mistake in selecting San Antonio for your place of meeting this year.

Of course, the questions that will come before you will cause us to enter into the arena of debate, but let us understand that while we may differ in opinion, that we, like knights of old, must take and give, and submit gallantly to victory or defeat. Whatever the subjects may be that we differ upon, they can have but one object—the good of the profession—therefore let us work to this end, and feel that we have done our duty to the profession and to legitimate medicine.

One word regarding the profession of our city. Long ago, when this city was a village and the noises which rent the air were the whoop of the Indian and the howl of the cayote, when a man's rifle and bowie knife were his most trusted friends, then we had medical men of the highest attainments who were the pioneers of medicine in this State. It is here, for the first time in the history of the State, that the talented and lamented Doctor George Cupples administered chloroform; it was here that the first hysterectomy was done; that the first ovariotomy, and the first lithotomy, were performed. These operations are now done daily all over this State, but in those days they denoted talent of the highest order. We are trying to follow in the footsteps of our predecessors who did so much to advance medicine in our State.

Now, about the unity of our profession—the medical profession. We have well attended medical meetings for scientific work, and we never hear the word ethics mentioned. We presume that every gentleman is ethical, and if he is not, a code will not make him so, for a gentleman needs no other code of ethics than that which is inherent. The West Texas Medical Association has increased its membership over 100 per cent. during the last three years.

The prosperity of our profession is evidenced by the fact that we have just completed a magnificent hospital, at a cost of $50,000, and every cent of the capital has been paid in, and is non-assessable, and is the enterprise of thirty-five or forty physicians of this city. With these facts before you, you can judge whether we have not cause to be proud of the way the profession of our city is doing.

I hope, gentlemen, that there will be nothing to mar the harmony and good feeling during this meeting, and that your stay in this city will be pleasant and profitable; and, whether you have come prepared to change your plan of organization, or to keep on in the same lines, you will no doubt act for the best, and I certainly trust that you will leave here a united body and so well pleased that you will come to see us again.

Dr. Red then responded to Dr. Paschal's address in the following manner:

Mr. Chairman, Gentlemen Representing the Municipality, Citizens, Ladies and Gentlemen:

It is with unfeigned pleasure that we have listened to your kindly words of welcome, especially so since they are couched in such well fitting and appropriate words. I believe it was Alexander Pope who wrote "it is the touch of the artist that says what we have often thought, but never thought so well," and I feel assured if he were here today he would say that the race of such artists is not dead.

We have met in San Antonio before, are here now, and welcome again, I hope; however, not so often as to make you twice glad. While we are here on this occasion, we can assure Mr. Webb that we have brought no skeletons with which to frighten his fellow citizens. Likewise can we assure Mr. Aubrey that we will not carry off the Alamo. To Dr. Paschal we say, it is with bowed heads we stand in acknowledgment of the skill and honor of the physicians of San Antonio, both present and past.

We grasp your "glad hand" and hope to show you by the avidity with which we partake of what you have provided that we are fully appreciative of your efforts; and further, if this program is a foretaste of what you have prepared, we can truly say that San Antonio is living up to her reputation for hospitality. You know there is a peculiar flavor about the hospitality

of San Antonio—a flavor born of years ago, when every man's shack was his castle and the silence of the long stretch from home to home was only broken by the multiple voice of the cayote—a hospitality unfeigned, unstinted, boundless.

With such before us, we feel assured that when we go home we will carry away a lasting memory of the good time we had in San Antonio.

Roll was called, and a quorum being present the minutes of last meeting were read by title and approved.

SECRETARY'S REPORT.

Dr. H. A. West then read his annual report, which is as follows:

Mr. President and Gentlemen:

I beg herewith to submit my annual report, as follows:

MEMBERSHIP.

On the roll Transactions for 1902:

Honorary	22
Ordinary	366
Total	388
Died	4
Total now on roll	384

DEATHS SINCE LAST REPORT.

Dr. W. A. Adams, Fort Worth. Died October 15, 1902.

Dr. A. B. Gardner, Bellville. Died October 22, 1902.

Dr. T. C. Osborn, Cleburne (honorary member). Died September, 1902.

Dr. B. F. Eads, Marshall. Died February 1, 1903.

Dr. W. H. Moore, Runge. Died March 11, 1903.

Dr. Osborn's death occurring prior to publication of the proceedings, his name was omitted from the list of honorary members in the last proceedings. These are the only deaths which have been brought to my attention. It is a singular fact that three at least of this number were present at the last meeting; I am not sure whether Drs. Eads and Osborn were present or not. Dr. Osborn, though an honorary member, took an active interest in the State Medical Association and had a high appreciation of its published proceedings. I recall a letter received from him not long previous to his death, in which he expressed his high regard for the Association and the work it was accomplishing in the State.

THE TRANSACTIONS FOR 1902.

The bid of Von Boeckmann, Schutze & Co., of Austin, as follows, was accepted:

For 600 copies long primer.....$1 15 per page
For 600 copies brevier ..... 1 20 per page

Publisher's Bill.

Six hundred copies Transactions:

Long primer, 431 pages at $1.15	$495 65
Brevier, 160 pages at $1.20	192 00
Six pages tabular matter at $2.00	12 00
Printing and mailing nine illustrations	22 50
Printing labels	2 00
Wrapping, mailing and addressing	15 00
Ten copies, morocco bound	6 00
Ten illustrations	45 00
Postage	29 18
Express charges	68 96
Express charges	18 00
Total	$906 29
Cost per volume	1 20
Cost per volume delivered	1 40
Number of copies delivered	527
Number of copies on hand	73

The books were ready for delivery in October. Publisher's bill was paid promptly upon presentation. The increased cost was due to the larger number of copies issued and to the increased size of the book, the volume of 1902 containing 124 pages more than that of 1901. The book speaks for itself and affords a good index as to the scientific progress of the personnel of the State Medical Association of Texas. I wish, however, to reiterate my opinion that the interest of the Association would be materially advanced by a change in the form of its publications from an annual volume to that of a monthly journal. Especially would this be the case if federation of the State Association, embracing the various district and county associations, becomes operative. Then, when it becomes necessary to keep in touch and publish the proceedings of the various branches, it would be necessary to journalize the proceedings.

My account with the Association is as follows:

H. A. West, in account with the State Medical Association of Texas:

1902. DR.

May 1, balance due the Association.....$ 6 15

May 12, Dr. L. L. Mahan, Hempstead, dues	$ 5 00
May 19, Dr. E. A. Walters, Crowley	5 00
July 17, draft on Dr. R. F. Miller	3 60
August 5, draft on Dr. R. F. Miller	6 00
August 23, draft on Dr. R. F. Miller	25 00
October 31, draft on Dr. R. F. Miller	5 60
December 9, draft on Dr. R. F. Miller	4 00
December 18, A. H. Noster, copy of Transactions	1 70
December 20, M. K. Lott, Cameron, dues	5 00
January 30, 1903, draft on Dr. R. F. Miller	3 75
February 18, A. S. Wolff, Brownsville	5 00
February 24, draft on Dr. R. F. Miller	15 25
March 23, Lavaca County Medical Association, dues	1 20
April 7, draft on Dr. R. F. Miller	21 60
April 25, Dr. A. G. Person, Snyder, dues and initiation	7 50
	$121 35

1902. CR.

May 1 to 26, postage	$ 1 50
May 3, rubber bands	30
May 3, registering book	1 25
May 5, express package to Dallas	70
May 19, stenographer	3 00
June 4, exchange and postage	50
June 24 to July 19, postage	2 35
July 3, express to Austin	45
July 18, stenographer	3 60
August 1, postage	1 25
August 5, Polk's Directory	6 00
August 14, express charges	1 00
August 20, freight and drayage	1 55
August 30, postage on circulars	10 50
August 30, addressing and mailing circulars	10 00
August 27, stenographer	2 75
October 31, stenographer	5 60
October 31, postage	50
December 3, postage	1 55
December 8, postage	1 80
December 9, stenographer	4 00
December 23, stenographer	1 00
January 31, 1903, stenographer	3 75
January 30 to March 30, postage	2 75
February 24, F. J. Finck, stationery	8 25

Stenographer	$ 6 00
Addressing postal cards	1 00
April 7, stenographer	7 20
April 7, F. J. Finck, stationery	3 60
Clarke & Courts, account of program	5 00
April 9, stamps for program	5 00
April 25, postage	1 00
April 25, Ella Devlin, stenographer	10 00
April 25, R. W., bal. addressing programs	1 00
	$115 70
April 16, balance due Association	5 65
	$121 35

REVISION OF CONSTITUTION AND BY-LAWS.

Complying with instructions received at the last meeting of the Association, I ordered 10,000 copies of the two reports on Revision presented at the Dallas meeting and sent a copy to members of the Association and of all affiliated societies whose membership list was in my possession. The Committee on Revision have had no occasion to meet and hence have no additional report to make. The matter, however, has been taken up by a committee from the West Texas Medical Association, consisting of Drs. Lankford, Kingsley and Russ. I have not received any report as to the last named committee's action in the premises. Dr. J. N. McCormack, of Bowling Green, Ky., has been appointed by the American Medical Association to aid the various States in the work of organization, and I am glad to say that he will be present at the preliminary meeting at San Antonio and will address the Association on the subject Tuesday, April 28th. It is hardly necessary for me to say that I sincerely trust this vexed question will be settled at this meeting and in accordance with the action of the American Medical Association and with that of many of the States.

AFFILIATING SOCIETIES.

When the 1902 Transactions was published there were twenty-nine societies in affiliation; since that time one new society has been organized, viz., that of Lavaca county. One of the oldest societies, i. e., the Central Texas, I understand from the Treasurer, has paid its dues for 1903, and will be present by its delegates at the coming meeting. Some months ago I addressed a communication to the secretaries of all the societies in affiliation, calling attention to the necessity of making payment of the per capita assessment on or before the first of April, and of appointing delegates to the San Antonio meeting. Eleven associations on the list have not paid

dues so far, and nineteen have not notified me as to the personnel of their delegates; to the latter I addressed a communication on April 7th, reminding the secretaries of these societies the necessity of complying with the Constitution and By-Laws, and calling attention to an error I had made in the caption at the head of the list of societies in the last proceedings, wherein the statement was made "that such societies would be entitled to representation at the next annual meeting of the Association." The statement should have been that they were entitled to representation at the last meeting. I am informed by the Treasurer that some of the societies in arrears for dues would make payment at the meeting. It is interesting to note the effect of postponement in the matter of constitutional revision, resulting in a decline in the number of new societies organized. Prior to the last meeting there were twelve new organizations; since the last meeting only one small county society has been added to the list and one district society re-admitted.

The following list of delegates has so far been reported:

Fort Worth Medical Society, Dr. Bacon Saunders, Fort Worth; Dr. R. E. L. Miller, alternate.

West Texas Medical Association, Drs. B. F. Kingsley and W. B. Russ, San Antonio.

South Texas Medical Association, members, 181; Dr. J. W. Scott, Houston; Dr. L. W. Chilton, Goliad; and Dr. Wesley A. Rape, Victoria. Dr. Scott was elected to represent the Association upon the Committee on Revision; Dr. W. G. Peterson, Lavaca, has since been appointed.

Hill County Medical Society, Dr. J. M. Martin, Hillsboro.

El Paso County Medical Society, Dr. S. T. Turner, El Paso.

Harrison County Medical Society, Dr. O. M. Heartsill, Marshall; Dr. Holman Taylor, alternate.

Kaufman County Medical Society, Dr. W. J. Pollard, Kaufman; Dr. James Orr, Terrell, alternate.

Johnson County Medical Society, Dr. J. D. Osborn, Cleburne.

Austin District Medical Society, Dr. F. E. Daniel, Austin; Dr. W. J. Matthews, Austin. Alternates, Drs. H. B. Hill and T. J. Bennett, of Austin.

Austin Academy of Medicine, Dr. M. M. Smith, Austin.

East Texas Medico-Chirurgical Society, Dr. E. W. Link, Palestine.

Williamson County Medical Society, Dr. J. C. Anderson, Granger.

San Angelo District Medical Association, Dr. Boyd Cornick, San Angelo.

Houston District Medical Society, Dr. J. W. Scott, Houston.

Lamar County Medical Association, Dr. J. F. Clark, Paris.

Northwest Texas Medical Society, Dr. Bacon Saunders, Fort Worth.

Van Zandt County Medical Society, Dr. T. M. Martin, Grand Saline.

Brazos Valley Medical Association, Dr. Daniel Parker, Calvert; Dr. J. M. Nicks, Stone City, alternate; Dr. W. S. Rice, Marlin; Dr. W. H. Allen, Marlin, alternate; Dr. I. P. Sessions, Rockdale; Dr. E. S. Ferguson, Cameron, alternate; Dr. I. P. Sessions, delegate to the Committee on Constitution and By-Laws.

Cooke County Medical Association, Dr. J. E. Gilcreest, Gainesville.

Grayson County Medical Society, Dr. J. T. Wilson, Sherman, delegate; Dr. J. B. Stinson, Sherman, alternate.

THE PROGRAM.

I regret very much that I have been unable to assign all the time necessary for reading and discussions of all the papers in the various sections. I fear many of the latter will be dissatisfied in regard to the assignment. It must be borne in mind, however, that nine sections appear upon the program for the first time in a good many years. It has only been within the past two years that the Section on Medical Jurisprudence has been represented; the Section on Pathology only within the past few years; the Section on Dermatology has hardly appeared in my remembrance. When the time practically has to be divided between nine sections besides that which is taken up with executive business and of social functions, the difficulty of affording sufficient time is evident. I would be glad if I could please everybody, or if some one else could take this disagreeable business off my hands. I have simply endeavored to accomplish the end to the best of my ability.

These facts further serve to emphasize the necessity of relegating the business affairs of the Association to a House of Delegates, leaving ample time for section work. It is impossible with the extensive program we have had in the past few years to give sufficient time to all the sections.

DUES.

I make the same suggestions in regard to dues as were made in my last report, viz.: in order to avoid confusion that dues as required by the present By-Laws be collected, but in the event of the adoption of a revised constitution and reduction in dues, that excess paid by members can be credited upon future payments.

I beg to advise you of the resignation of Dr. T. M. Taylor, of New York. Dr. Taylor writes "he takes this step with regret, and does so only in consequence of the probable reorganization of the Association."

I also advise you of the appointment by the Surgeon General of the Marine Hospital Service, of Dr. Chas. Wardell Stiles, of Washington, D. C., as a representative of the service to attend this meeting.

Respectfully submitted,

H. A. WEST,
Secretary.

On motion the report of the Secretary was referred to the committee appointed by the President, consisting of Drs. T. J. Bell, W. Shropshire and R. E. L. Miller.

Dr. R. F. Miller then read his annual report as follows:

TREASURER'S REPORT.

R. F. Miller, Treasurer, in account with the Texas State Medical Association:

DATE.	RECEIPTS.	AMOUNT.
May 5, 1902	To balance on hand as per annual report	$ 1,628 35
Apr. 28, 1903	To dues collected since last annual report	1,815 40
		$ 3,443 75
	DISBURSEMENTS.	
May 9, 1902	By cash paid H. A. West, secretary's salary	$ 200 00
May 9, 1902	By cash paid R. F. Miller, treasurer's salary	150 00
May 9, 1902	By cash paid S. Bennett, stenographer, return to New York, hotel, etc.	91 80
May 9, 1902	By cash paid Von Boeckmann, Schutze & Co., constitution report.	13 50
May 9, 1902	By cash paid A. G. Agnew, assistant to secretary	25 00
May 9, 1902	By cash paid janitor and porter in city hall	3 00
May 9, 1902	By cash paid Miss Angel, committee stenographer	13 70
May 9, 1902	By cash paid F. J. Finck, programs, mailing, etc.	32 05
May 9, 1902	By cash paid Commercial Printing Co., district maps	8 00
May 15, 1902	By cash paid United States postage	10 00
May 27, 1902	By check paid H. A. West, delegate expenses to Saratoga	120 00
June 26, 1902	By check paid A. G. Agnew, public health committee circulars.	200 00
June 27, 1902	By cash paid United States postage	10 00
July 10, 1902	By check paid Sherman Printing Co., treasurer's stationery.	11 00
July 10, 1902	By check paid Franklin Printing Co., president's stationery.	6 00
July 10, 1902	By cash paid M. and P. National Bank, collection 5 checks.	50
July 19, 1902	By draft paid H. A. West, stenographer	3 60
Aug. 1, 1902	By cash paid United States postage	5 00
Aug. 1, 1902	By check paid W. L. Hay, agent treasurer's bond	10 00
Aug. 7, 1902	By draft paid H. A. West, Polk's Directory	6 00
Aug. 25, 1902	By draft paid H. A. West, addressing circulars and postage.	25 00
Sept. 15, 1902	By check paid Von Boeckmann, Schutze & Co., reports	28 00
Oct. 15, 1902	By cash paid United States postage	5 00
Oct. 17, 1902	By check paid Von Boeckmann, Schutze & Co., Transactions	906 75
Nov. 3, 1902	By draft paid H. A. West, stenographer expense	5 60
Dec. 12, 1902	By draft paid H. A. West, stenographer expense	4 00
Feb. 4, 1903	By cash paid H. A. West	3 75
Feb. 4, 1903	By cash paid United States postage	5 00
Feb. 4, 1903	By check paid Franklin Printing Co., president's stationery.	14 00
Feb. 27, 1903	By check paid R. F. Miller, expense to Dallas committee, January, 1902.	10 00
Feb. 27, 1903	By draft paid H. A. West, Finck, postals, printing, etc.	15 25
Apr. 1, 1903	By cash paid United States postage	5 00
Apr. 9, 1903	By draft paid H. A. West, programs, etc.	21 60
Apr. 28, 1903	Total expenses	$ 2,065 10
Apr. 28, 1903	Balance on hand	1,378 65
		$ 3,443 75

The Treasurer begs to add that he has made great efforts to collect the dues from each member and society, in a business-like manner, without giving offense. However, it has been necessary to drop thirty-four members for refusal to pay, in response to repeated notice and draft. A number who have not paid have been continued on the list because of the drought and poverty, and a few by reason of long absences from the State and the United States.

The promptness with which most of the medical societies of the State have paid their dues, and continued in affiliation, promises much to all of us who are anxious for an organized and united profession in Texas.

The Treasurer regrets that an increase of more than $500 in expenses during the past year has left a smaller cash balance than at the last annual report.

Dr. West moved that the report be received and referred to same committee as Secretary's. Carried.

Dr. Cantrell presiding, the President, Dr. S. C. Red, then read his annual message and recommendations as follows:

RECOMMENDATIONS OF THE PRESIDENT.

Fellow Members of the Association:

You doubtless recall that, about four months ago, you received a card from me inviting suggestions as to what, in your opinion, would be for the best interests of the Association. A generous response was given to this request, and from it I gain a fairly definite idea as to what the members want.

Far and away above all other matters, the Constitution receives the most attention. Varied and diverse views are expressed concerning it, but with one accord they all sound a note of harmony. Nearly every one says, "Do nothing that will create discord in the Association." With such a universal feeling of concession, I feel assured, when the subject comes up for disposal, at this meeting, that no difficulty will be found in coming to a satisfactory conclusion.

The next most noticed, in these replies, is really a criticism of the officers. Quite a large number suggested that our Association be conducted on more business-like methods. They seem to think that the sessions should be conducted according to the program, and not to allow one session to encroach upon the other. In response to this, I wish to say that it shall be my earnest endeavor to conduct the affairs of this meeting "strictly according to business methods." If it is conducted too strictly, I invite suggestions. You may expect, then, to have the sessions called exactly on time, even if there is but one member present. The By-Laws will be diligently enforced, so do not think it is anything personal if you are called down.

The next subject in point of numbers, claiming the attention of my correspondents, was advice of various kinds concerning politics in this Association. The most of them, in discussing the subject, wanted all matters political disposed of by a House of Delegates, as provided for in the new constitution. Some two or three did not think the members wanted to be disturbed by political affairs, having come for scientific work, and that by leaving such matters alone, they would see them attended to. Whether they are political Tom Sawyers or professional humorists I do not know.

Quite a number, that did me the honor to reply, had no suggestion to make. They were either indifferent or well satisfied with present conditions.

The cost of membership, in the opinion of some, is too high. Others think we should have a death benefit, as in some secret orders. Some give the Osteopaths and masseurs a rap. Then again, quarantine, educational and health matters are discussed. Amendments to our present State laws, occupation tax, and membership are subjects touched upon. Some few want a journal, run by the Association. Others want more attention paid to social functions, assigning as a reason that part of the cause for many attending is the opportunity to visit such affairs. One correspondent suggested a clinic at each meeting by some eminent member of the profession. Another suggested that a bureau of information be furnished by the Committee of Arrangements. This would contribute much to the comfort of the members and should be adopted as the custom of each meeting.

The above by no means covers all the suggestions offered, but gives a general view of the trend of most of them. It simply goes to show that in an Association like this there are many wants to supply.

Most of them come for the scientific work. Others come for various reasons—political excitement, social functions, a rest, pleasant companions, new scenes and a general good time. No single one gets all he wants, but there is enough of every kind to be a drawing card for all, even to the big city doctor, for sometimes he is there with "an ax to grind."

Now, possibly, I might interest you for a moment in what may foster very materially the attendance at our meetings, viz.: Form a legion of honor by giving to each member that has attended ten consecutive meetings a badge or medal of appropriate design. This medal could be selected by a committee of three, appointed by the President, to report at the next meeting. The attendance of the members could be determined by the registration books, kept at each meeting, that now doubtless are in the hands of the proper officers. If they have not been carefully preserved, the date of counting should begin from that time at which attendance could be definitely determined by the Secretary, Treasurer and President, acting as a committee. There are those that feel disposed to laugh at decorations of this kind, but men in all times have been pleased by such, and those of

our profession that are members of the A. M. A. are proud to wear its buttons in the lapel of their coats. And I doubt not but that some such procedure would act in like manner in this instance.

There is still another subject well worth the attention of the Association, viz.: a permanent home. There are several cogent reasons why such a move should not be made, the most important of which would be a loss, in a great measure, of the social features of the meetings. It is but natural to suppose that where the body would meet permanently it would be quite a tax on the city to furnish annually such receptions as we have been accustomed to under the present arrangement. Neither could we expect to secure the local membership obtained by meeting from place to place. There are some advantages, however, in a home that can not be secured otherwise, viz.: the opportunity to establish a pathological exhibit, the securing of a medical library, the construction of facilities for holding clinics by eminent members of the profession. Heretofore, although recommended time and again, the Association has seen fit not to establish a journal. This would then, in a measure, show to the average member some tangible evidence of return for annual dues. Several plans might be suggested as to how this matter could be worked out, one of which could be to set aside a certain per cent. of the annual dues, provided they are kept on the present standard, until they reach such a sum as to warrant the construction of a building, at some central city, where ample facilities in the way of transportation and hotel accommodations exist. There are other, and probably better, methods that would suggest themselves than this. It is open to discussion. I leave the subject with you, and bespeak for it your attentive consideration.

The President further thinks that it would be desirable for this Association to assume all costs of defending its members against malpractice suits; that is, suits where the ground of action arose during the membership of the party sued. The cost of such suits could very readily be borne by this Association and the security engendered thereby would, in a great measure, go to cement the union of its members.

Thanking you for your indulgence, I am,

Yours truly,

S. C. RED,
President.

Dr. M. M. Smith moved that recommendations be received and referred to a committee of three. The motion carried, and the Chair appointed Drs. M. M. Smith, Taylor Hudson and J. D. Osborn.

President Red presiding, Dr. J. N. McCormack, of Bowling Green, Ky., delivered an address on "Medical Organization."

Dr. M. M. Smith moved that a rising vote of thanks be extended to Dr. McCormack. Carried.

DR. SHROPSHIRE: I move that Dr. McCormack's address be published and a copy be sent to every doctor in Texas, as I deem it one of the finest works we could read on this important subject, and in that way we will have time to read it carefully and it will do good missionary work toward stimulating organization throughout the State.

Motion carried.

Dr. McCormack decided it was best not to have the address published.—EDITOR.

Dr. John T. Moore then read the following resolution:

RESOLUTION ADOPTED AT PRELIMINARY MEETING OF THE TEXAS STATE MEDICAL ASSOCIATION, APRIL 27, 1903.

Be it resolved, That this meeting endorses without alteration or qualification the plan of reorganization embracing County and State Associations as outlined by the Committee on Reorganization of the American Medical Association, and that the chairman of the committee be instructed to present this resolution to the State Association in session.

DR. J. C. LOGGINS: I move that we adopt the plan of reoganization of the American Medical Association, and that the paper of Dr. McCormack be referred to a committee of delegates, who have to report at a later meeting, in order to get it before you.

DR. H. A. WEST: In order to obviate any confusion, as several committees have been mentioned, I move an amendment that the representatives from the various affiliated societies get together and name their representative upon the provisional House of Delegates, to whom the question of the revision of the Constitution and By-Laws has been referred. That they make this selection during the recess and be ready to report the names immediately after dinner.

DR. M. M. SMITH: If the motion is before the house, and before the report is accepted, I would like to amend, or offer as a substitute, that this report from the committee from the West Texas Association be referred to this committee, and further that its members be present at their deliberations.

DR. OSBORN: One man cannot do the work of five.

DR. RUSS: If the doctor's motion prevails only four of the committee will be added to your provisional House of Delegates, the fifth being already

a member. These four, as I understand it, will be present in a purely advisory capacity, and, since they have all carefully studied the reorganization problem, I believe that their views on the subject are well worth hearing.

DR. JAMES ORR: It seems to me that any committee would have a right to be present, and the idea of the West Texas, or any other locality interested, would have a right to be present and vote on the different questions. If we are going to go over this majority and minority report again and again, and as we have adopted the Association plan, let us notify anybody that we want to be present.

DR. T. J. BELL: I favor the motion, because I think the other proposition is irregular. This House of Delegates is composed of men from the different county societies and, as Dr. Orr has said, we have the right and privilege to ask anybody to be present that we want before us in the House of Delegates; any one has the privilege to come before them that wishes.

DR. CANTRELL: I think you misunderstand Dr. West. He requests that the different delegates from the different associations that have representatives here, get together and see who is going to represent them in the temporary House of Delegates.

Motion as amended was then adopted.

Dr. H. A. West then offered the following resolution:

According to a resolution of Dr. Shropshire, at the last meeting of the Association, the matter of revision of Constitution and By-Laws was to be referred to a committee consisting of one delegate from each affiliated society, so that it will be unnecessary to constitute a special committee, or Provisional House of Delegates, for that purpose, I move that this committee be now organized and the matter referred to them.

The resolution being duly seconded and carried, the following provisional House of Delegates was appointed:

North Texas—Dr. C. E. Cantrell, Greenville.
Austin District—Dr. F. E. Daniel, Austin.
Smith County—Dr. T. J. Bell, Tyler.
Central Texas—Dr. J. M. Frazier, Belton.
South Texas—Dr. J. W. Scott, Houston.
West Texas—Dr. W. B. Russ, San Antonio.
Houston—Dr. J. W. Scott, Houston.
Austin Medical—Dr. M. M. Smith, Austin.
Rogers Medical Society—Dr. G. T. Thomas, Rogers.
Lavaca County Society—Dr. W. Shropshire, Yoakum.
Kaufman County Society——Dr. James Orr, Terrell.

Williamson County Society—Dr. J. C. Anderson, Granger.
East Texas Society—Dr. E. W. Link, Palestine.
Harrison County Society—Dr. O. M. Heartsill, Marshall.
Comanche County Society—Dr. T. P. Weaver, De Leon.
San Angelo Society—Dr. Boyd Cornick, San Angelo.
Cooke County Medical Society—Dr. F. D. Garrett, Gainesville.
Brazos Valley Medical Society—Dr. I. P. Sessions, Rockdale.
Johnson County Medical Society—Dr. J. D. Osborn, Cleburne.

Dr. Osborn moved that Dr. McCormack's name be sent to the Judicial Council for membership on the honorary list.

Carried by rising vote.

Adjourned until 2:30 p. m.

FIRST DAY.—*Afternoon Session.*

Dr. Red called the Association to order promptly at 2:30 p. m.

Dr. James H. Bell moved that a recess be taken for twenty minutes, which was duly seconded and carried.

The President, having called the Association to order, appointed the following to fill vacancies on the Judicial Council:

Dr. G. T. Thomas, Rogers.
Dr. J. F. Y. Paine, Galveston.
Dr. S. E. Milliken, Dallas.
Dr. J. H. McCracken, Mineral Wells.
Dr. J. T. Moore, Galveston.
Dr. W. A. Rape, Victoria.
Dr. R. R. Shapard, Anson.
Dr. J. R. Nichols, Terrell.

Dr. J. D. Osborn, of Cleburne, offered the following:

Whereas, It has come to our knowledge that our dearly loved ex-President, Dr. J. T. Wilson, of Sherman, Texas, is prostrated by severe illness, and thus prevented from being with us, be it

Resolved, That, by a rising vote, the President of this Association be instructed to send a telegram of sympathy and condolence, and call down the choicest blessings of God for his speedy recovery.

Duly seconded and unanimously adopted.

A resolution was offered by Dr. J. T. Moore extending the courtesies of the Association to Dr. Stiles, as representative of the Marine Hospital Service.

The executive session was adjourned and Dr. J. T. Moore, of Galveston, as Chairman of the Section on General Medicine, called that Section to order, and read the Chairman's address.

Dr. Love, of New York, not being present, Dr. J. S. Lankford, of San Antonio, read a paper on "Diphtheritic Paralysis."

The paper was discussed by Drs. W. A. Harper, of Austin; W. B. Collins, of Lovelady. The time of Dr. Collins was, upon motion, extended in order to permit the completion of his discussion. Dr. C. W. Goddard, of Holland, closed the discussion.

Maj. Chas. F. Mason, U. S. A., read a paper entitled "Malta Fever—Report of a Case."

The paper was discussed by Drs. H. W. Crouse, of Victoria; H. A. West, of Galveston; J. T. Moore, of Galveston; and closed by Dr. Mason.

Dr. H. A. West, of Galveston, read a paper "Some Remarks on the Subjective Symptomatology of Heart Disease," which was discussed by Drs. H. W. Crouse, of Victoria; Frank Paschal, of San Antonio; W. B. Collins, of Lovelady; and closed by Dr. H. A. West, of Galveston.

This closed the Section on General Medicine, and the Section on Obstetrics and Diseases of Children was called.

The Chairman of the Section on Obstetrics being engaged in important committee work, on motion of Dr. H. A. West, Dr. J. T. Moore was continued in the chair as Chairman of this Section.

The papers of Drs. J. C. Anderson and E. M. Thomas were passed, and Dr. H. W. Crouse read a paper on "Circular Laceration of the Cervix Uteri."

Dr. John B. Holt, of Lockhart, read a paper entitled "Bronchitis in Children," which was discussed by Drs. H. W. Crouse, of Victoria; Bethel Nowlin, of Jonah; W. C. Moore, of Runge; Frank Paschal, of San Antonio; and closed by Dr. Holt.

Dr. J. C. Anderson, of Granger, having completed his committee

work, then took charge of the Section on Obstetrics, and read the Chairman's address.

On motion of Dr. Wm. Keiller, of Galveston, the Association adjourned until 9 o'clock Wednesday morning.

SECOND DAY.—*Morning Session.*

At 9 o'clock Dr. Red, President, called the Association to order and stated that this hour was set apart by the program for the transaction of executive business.

The President then called the attention of the Association to the fact that the Examining Board would expire with this meeting and that eighteen names should be presented to the Governor.

DR. CANTRELL: At the time we selected the names, from which the Governor should appoint nine, there were fifteen congressional districts; now we have sixteen. It will be necessary to choose two from the State at large, where we choose three. We had a separate Nominating Committee for this board. I think that this will be well. I move that the different congressional districts attending this meeting shall select a delegate from each congressional district to serve on the Nominating Committee.

DR. OSBORN: The number of gentlemen present at this session is too small for that motion to be put now. That committee has been working hard on their report for the last two years, and we certainly ought to wait until we hear the reading of their report—then it will be time for this motion to be brought forward for us to discuss. My idea is, and in talking it over with other members of the Association, that we recommend to the Governor the names of the nine men who have already so successfully put in operation this bill, and in carrying it out they have been at great expense and, until lately, have not been recompensed. Leave it to them to select nine or ten other men whose names shall be recommended, and they be sent by us to the Governor and, by this resolution, asking the Governor to reappoint that same board. They certainly have the work well in hand and are working for its best interests, and we should not dispose of that committee, but ask the Governor to reappoint them. At any rate, let us wait and hear the committee report. They tell us that they will be ready at some later hour.

DR. H. A. WEST: It will simplify matters to refer the nomination of the Medical Examiners to the Nominating Committee, as this committee

represents all the congressional districts, and it is entirely unnecessary to have a special committee for that purpose.

DR. TAYLOR HUDSON: I believe that Dr. Osborn is right in his position that this matter rest until we hear the report of the State Medical Examining Board. We ought to have that report, then refer their report to this committee, or any other committee, for their action in the matter.

Dr. Osborn moved that the matter be deferred until tomorrow's executive business.

Dr. West moved as a substitute that the matter be sent to the Nominating Committee for their action. Substitute carried.

Dr. M. M. Smith, Secretary of the Judicial Council, reported the admission of new members, and that of Dr. J. N. McCormack, of Bowling Green, Ky., as an honorary member.

The report was duly adopted.

DR. CROUSE: Gentlemen, we have with us at the present time, Dr. Charles Wardell Stiles, chief pathologist of the Marine Hospital Service, of Washington, D. C. A great honor has been conferred upon the State Medical Association of Texas by Surgeon General Wyman, in detailing Dr. Stiles for this meeting. Dr. Paschal and myself, through the co-operation of our worthy President, Dr. Red, were able to secure Dr. Stiles only after an extensive amount of correspondence. I wish to make a motion that Dr. Stiles, not only as a mere form, but as a justice due him, be elected as an honorary member of the State Medical Association of Texas.

DR. S. C. RED: The matter will have to be referred to the Judicial Council.

And it was so referred.

Dr. J. T. Moore called the Judicial Council to meet.

The committee to whom was referred the reports of the Secretary and Treasurer made report recommending that said reports be adopted as read to the Association. Report of the committee was adopted.

Dr. M. M. Smith, as chairman of the committee to whom was referred the President's message and recommendations, then made the following report:

We, your committee appointed to examine the recommendations of the President of this Association, beg leave to report that, taking these recommendations up in the order mentioned in said report, we are heartily in

favor of establishing a legion of honor in this Association, and that it will be well to give a badge, or medal of appropriate design, to those members of the Association who have attended ten consecutive meetings. We therefore suggest that this recommendation be referred to the House of Delegates for their favorable consideration. In reference to the question of a permanent home for this Association, we are of the opinion that this plan is not feasible at this time, but it is a question that should receive careful consideration of this Association, when its funds and membership would justify such an undertaking. We further desire to report that we are opposed to this Association journalizing its transactions, as we do not believe that the plan is feasible, and we are of the opinion that the publication of the Transactions in the present form is unquestionably the best plan, but suggest that they should be placed in the hands of the members at the earliest moment possible. We do not favor the suggestion that this Association assume all costs of defending its members against malpractice suits. We desire to especially commend the plan adopted by your honored President in addressing a communication to the different members of this Association, several months before its annual session, and thereby obtaining from tabulated replies those points of special interest to its membership.

Respectfully submitted,

M. M. SMITH,
J. D. OSBORN,
TAYLOR HUDSON.

Dr. H. A. West then moved that the section referring to a journal of the Association be stricken out as entirely gratuitous, and that the balance of the report be adopted.

The motion, as thus amended, was carried.

Dr. M. M. Smith offered the following report from the Provisional House of Delegates:

We, your Committee of House of Delegates, met on the afternoon of April 28, and upon roll call found delegates representing the Medical Societies of the State as follows:

Austin District Medical Society.—Dr. F. E. Daniel, Austin.
Austin Academy of Medicine.—Dr. M. M. Smith, Austin.
Brazos Valley Medical Association.—Dr. I. P. Sessions, Rockdale.
Central Texas Medical Association.—Dr. J. M. Frazier, Belton.
Comanche County Medical Society.—Dr. T. P. Weaver, Del Rio.
Cooke County Medical Society.—Dr. F. D. Garrett, Gainesville.
East Texas Medical Society.—Dr. E. W. Link, Palestine.

Harrison County Medical Society.—Dr. O. M. Heartsill, Marshall.
Houston Medical Society.—Dr. J. W. Scott, Houston.
Johnson County Medical Society.—Dr. J. D. Osborn, Cleburne.
Kaufman County Medical Society.—Dr. James Orr, Terrell.
Lavaca County Medical Society.—Dr. Walter Shropshire, Yoakum.
North Texas Medical Society.—Dr. C. E. Cantrell, Greenville.
Practitioners Society of Dallas.—Dr. S. E. Milliken, Dallas.
Rogers Medical Society.—Dr. G. T. Thomas, Rogers.
San Angelo Medical Society.—Dr. Boyd Cornick, San Angelo.
Smith County Medical Society.—Dr. T. J. Bell, Tyler.
South Texas Medical Society.—Dr. J. W. Scott, Houston.
West Texas Medical Society.—Dr. W. B. Russ, San Antonio.
Williamson County Medical Society.—Dr. J. C. Anderson, Granger.

After discussing the plan of reorganization recommended by the American Medical Association, and inviting the Honorable Representative of that body, Dr. J. N. McCormack, to explain certain points which were under discussion, your committee, or House of Delegates, beg leave to make the following unanimous report and to recommend its adoption by this Association:

Resolved, That the Constitution and By-Laws just adopted shall go into effect upon the adjournment of this annual meeting, except that the outgoing President shall appoint the council provided for in it at his earliest convenience, to serve for one year, or until the House of Delegates elects a council in 1904, and that such council shall organize, divide the State into fifteen councilor districts, map out and arrange its organization work for the coming year, and report its plan to this Association before final adjournment.

Resolved, That the Secretary be authorized to have printed five thousand copies each of the Constitution and By-Laws for the State and county societies, for distribution as soon as practicable to the members of this Association, and from time to time to such other physicians as may be indicated by the respective councilors, and that he also be authorized to provide such stationery and blank forms as may be necessary to put the new plan into operation. And that the Secretary's salary remain for the next year the same as now exists, and that he be authorized to employ a stenographer when necessary.

Resolved, That the President and Secretary are hereby authorized to issue charters to county societies during the year, upon the approval of the executive committee of the council. And be it further

Resolved, That new members accepted by county societies after the adjournment of this annual meeting, to pay their dues to the State Association in advance, shall be credited for such dues as for the year 1904, prac-

tically obtaining membership for two years for one fee, but that this shall not apply to the dues to the county society for the current year.

S. C. RED President.
M. M. SMITH, Secretary.

The above report was unanimously adopted.

DR. M. M. SMITH: I move that the Secretary of this Association be authorized to send a telegram to the Secretary of the American Medical Association, informing him of the action of the Association at this time.

Carried.

Section on Surgery was called, and Dr. Wm. Keiller took the chair. In the absence of Dr. Gunby, Secretary of this Section, Dr. Keiller called Dr. H. W. Crouse to the secretary's desk.

Dr. Wm. Keiller then read the Chairman's address, entitled "The Relation of Anatomy to Surgery."

Next paper on the program was "The Anatomical Basis of Scientific Amputation," by Dr. J. E. Thompson, Galveston. Dr. Thompson not being present, Dr. Keiller announced that he had Dr. Thompson's paper and illustrations in his possession, and asked the pleasure of the Section. On motion, it was decided that Dr. Keiller read and illustrate Dr. Thompson's paper.

"Gross and Microscopic Anatomy of the Vermiform Appendix, and Its Bearing on Appendicitis," by Dr. H. B. Decherd, of Galveston, was read by the Chairman, Dr. Keiller, and was profusely illustrated.

Dr. Shropshire moved that discussion on all papers in the symposium on appendicitis be postponed until all papers had been read.

Motion carried.

Dr. H. A. Barr, of Beaumont, read a paper entitled "Appendicitis, with Report of Cases."

The following list of Councilors having been appointed was then read by President Red:

First District.—S. T. Turner, El Paso.

Second District.—P. C. Coleman, Colorado.

Third District.—D. R. Fly, Amarillo.

Fourth District.—C. M. Alexander, Coleman.
Fifth District.—W. B. Russ, San Antonio.
Sixth District.—A. E. Spohn, Corpus Christi.
Seventh District.—T. J. Bennett, Austin.
Eighth District.—Walter Shropshire, Yoakum.
Ninth District.—J. T. Moore, Galveston.
Tenth District.—B. F. Calhoun, Beaumont.
Eleventh District.—S. R. Burroughs, Buffalo.
*Twelfth District.—W. R. Blailock, McGregor.
Thirteenth District.—J. H. McCracken, Mineral Wells.
Fourteenth District.—C. E. Cantrell, Greenville.
Fifteenth District.—Holman Taylor, Marshall.

The Judicial Council, through its Chairman, Dr. J. T. Moore, made a report containing a list of new members, which was, upon motion, duly adopted.

Dr. F. P. Miller, of Midland, read a paper on "Appendicitis—A Discussion of Its Treatment."

The papers of Drs. Decherd, Barr and Miller were then discussed by Drs. H. W. Crouse, of Victoria; W. B. Collins, of Lovelady; T. P. Weaver, of De Leon; J. H. Reuss, of Cuero; Nicks, of Stone City; F. D. Garrett, of Gainesville; Wm. Keiller, of Galveston; closed by H. A. Barr, F. P. Miller and J. F. Y. Paine.

Dr. H. W. Crouse then read a paper entitled "Rubber in Windowing Compound Fracture Cases," which was discussed by Drs. H. A. Barr, of Beaumont; Chas. Wardell Stiles, M. H. S., Washington, D. C.; Wm. Keiller, of Galveston; F. P. Miller, of Midland, and closed by Dr. Crouse.

"Extra-Uterine Pregnancy" was the title of a paper presented and read by Dr. J. S. McCelvey, of Temple, which was discussed by Drs. J. F. Y. Paine, of Galveston; T. P. Weaver, of De Leon; J. T. Moore, of Galveston; J. M. Frazier, of Belton; J. T. O'Barr, of Ledbetter, and closed by J. S. McCelvey, of Temple.

Adjourned until 2 p. m.

*Dr. Blailock being absent from the State, the President appointed Dr. J. J. Robert, Hillsboro, in his place.

SECOND DAY.—*Afternoon Session.*

At 2 o'clock the Association was called to order by President Red.

The Section on Medical Jurisprudence was then called, and Dr. J. R. Nichols, of Terrell, took the chair.

On motion of Dr. Red, the Section took a recess for fifteen minutes.

At the close of the recess Dr. Nichols again called the Section on Medical Jurisprudence to order and read his annual address as Chairman.

Dr. Marvin L. Graves then presented "Clinical Notes of Mental Diseases."

Dr. Graves's paper was discussed by Drs. J. F. Y. Paine, of Galveston; E. W. Link, of Palestine; W. W. MacGregor, Laredo; E. E. Guinn, of Jacksonville; closed by Dr. Graves.

At the close of the discussion on Dr. Graves's paper, the following telegram was read by President Red:

SHERMAN, Texas, April 29th, 1903.

Dr. S. C. Red, President State Medical Association, San Antonio, Texas:

Accept my sincere thanks. Assure Association of my profound gratitude.

J. T. WILSON.

"Degenerative Stigmata" was the title of a paper read and illustrated by Dr. G. H. Moody, of San Antonio.

The Judicial Council, through Secretary M. M. Smith, offered a report containing a list of new names.

Discussion was then had by Drs. Nicks, of Stone City; W. W. MacGregor, of Laredo.

"Expert Witness in Court" was the title of a paper sent by Dr. J. C. Carleton, of Bonham, and, on motion, the paper was read by the Secretary of the Section, and referred to the Publishing Committee.

Dr. Robt. B. Sellers, of Comanche, sent a paper entitled "The Plea of Insanity in our Courts." The paper was read by caption and referred to the Publishing Committee.

A recess was then taken for fifteen minutes. At the end of the

recess, President Red called the Association to order and the following memorial services were held:

DR. A. B. GARDNER, BELLVILLE.

DR. GRAVES, San Antonio: It is always a melancholy duty to respond to an announcement of the death of our co-laborers, especially of one who took such an active interest in the welfare of our Association work as our deceased brother, Dr. A. B. Gardner. For twenty years he was a most active and earnest worker in the ranks of the profession along broad lines. He gave much of his time and the enthusiasm of his many sided nature to the development of high ideals. In all of his professional life he was foremost in the affairs of the official organism, and spent much of his time in trying to develop the State Medical Association along these lines. He did a great deal of active work for our Association. In 1889 the Association elected him President, which office he filled most acceptably and satisfactorily to the members of the Association.

Dr. Gardner was born in Warren county, Ky., November 7, 1852. He secured such education as the troublesome times during the Civil War afforded. In 1868 he entered the State University of Kentucky, remaining there some years, and in 1871 he began the study of medicine at the University of Louisville, Ky., and graduated therefrom in 1874. He then came to Texas and located at McDade, in Bastrop county, where he practiced for some years with zeal and success. Being an ambitious and progressive man, and not satisfied with his attainment, he desired to secure better education and advantages, and so went to New York, where, in 1881, he graduated at Bellevue Hospital and, after securing his diploma, returned to his adopted State and removed to Bellville, Texas, where he remained until his last illness and death. I am informed that in 1876 Dr. Gardner was happily married to Miss Hattie Campbell, of Bastrop, and from that union there resulted two children, a boy and a girl, now both about grown to manhood and womanhood. His wife and children survive him and were with him when the end came.

An earnest, active, vigorous manhood was his, and he was a staunch friend, an earnest worker, successful practitioner of medicine.

Up to his final illness he had been a worker in the professional field with energy and fidelity, and the Doctor was unwilling to submit to early departure and used every endeavor to recover his health, and finally left for Mineral Wells, and although he felt the possible approach of death, he went around and told his friends goodbye. He reached Mineral Wells and there secured attention and treatment with the hope of improvement, but the ravages of the disease had already claimed him, and it was impossible to arrest it, so he rapidly grew worse and the news was carried over the wires that

he was sinking, and, such was the esteem in which he was held, that a delegation from the Masonic fraternity was sent to be with the family and escort him home from Mineral Wells. They found him very ill and tried to get him home and thirty hours after their arrival he expired, surrounded by his wife and children, and the friends that he had loved.

No man in the Medical Association enjoyed wider acquaintance or larger personal friendship. He recognized that "every man is his own star, our acts our angels are" for good or ill, and acted upon that hypothesis all through his life, and we hope and trust that he has become a bright star in the firmament above.

DR. J. D. OSBORN: During this solemn hour, I, too, wish to pay a tribute to the memory of my departed friend, Dr. A. B. Gardner. It seems to me, at this meeting of our Association, something is wanting, something absent, and when I come to analyze the cause, I know that it is the absence of Dr. Gardner. He was always with us, with his genial friendship and his great loyalty. He held this Association in the highest esteem, always working for its betterment. He was ever the friend of the working, struggling young doctor; he was the friend of every member of the medical profession, always holding out a helping hand and giving cheering words of advice and encouragement. Dr. Gardner's loss is a serious blow to us as an organization, for he was ever ready to do all in his power, with his counsel or his finances, towards building up the great work that we have mapped out.

By nature he was a gentleman, and his bearing towards his fellow-man marked that fact. Had Dr. Gardner's life been spared, it would have been his greatest pride and delight to have won the "Badge of Honor" of this Association, which has been adopted at this session by recommendation of our President; he was one of the few entitled to wear it, for he never missed a meeting. Loyalty to his friends was the brightest star in his environment. He was a great lover of nature, and welcomed the beauties thereof as God's handwriting, and saw God's handwriting in all of its beautiful effects. In his home, he was a lovable and affectionate husband and father. It was my good fortune to know his inner life in that respect, and I loved him the more for it.

"To him, I trust, a place is given
Among the saints in Heaven."

DR. M. M. SMITH: I only regret that I did not have time to make some preparation, so as to be able to say something in memory of my friend, Dr. Gardner. When I joined this Association, if I remember correctly, one of the first hands to grasp mine was that of Dr. Gardner. I think every Association that I have attended since, except this one, I had the pleasure

of meeting Dr. Gardner. I have served this Association on a number of legislative boards with him; there never was a time when we called upon him to go to Austin to assist in legislation in the interest of organized medicine, that he did not respond; in fact we never called upon him, that I can remember, in his life as a member of the profession, so far as I have learned, that Dr. Gardner did not respond with that openness, with that earnestness, and with that enthusiasm that was characteristic of the man. We all knew him, respected him, loved him and enjoyed meeting him at our Association. He took an active part in all discussions that were of importance to organized medicine, and we miss him here today, and we shall always miss him. I think that one of the most important parts of the meeting that we have in this Association are the Memorial Services. Those of us who are left behind should not forget those who have gone before. This, to me, is such a moment for Dr. Gardner, who was one of our best and honored members of this profession, and I feel that I must at least say something in his memory.

DR. H. A. WEST: It is an interesting and solemn fact that several who are on our death roll today, were with us at our last meeting; among that number was Dr. Gardner. The stamp of death was then upon his brow, but who having looked at him and listened to his earnest discussions of all matters that were brought before us, would have recognized the fact? What a lesson to those of us who are left—"in the midst of life truly, we are in death; we know not the day nor the hour when the Son of Man calleth."

DR. W. A. ADAMS, FORT WORTH.

DR. JOS. BECTON, of Greenville: Gentlemen, this is a painful duty for me today. I am sorry that I am not better prepared to say something on the death of my friend, Dr. Adams. I have known him fifteen years. I presume I know him better than any man outside of Fort Worth. I am sorry that I have no data to say something in his memory. This I remember: He was reared and educated in Louisiana, graduated M. A. and went to Atlanta and there took his M. D., located at Bryan and there married in 1870; remained there some time, then moved to Fort Worth, and went into partnership with Dr. Bell, and lived there for a number of years, in fact, until his death. He was Chief Surgeon and Medical Director of the Equitable Life for Texas, Arkansas and Louisiana, and, in fact, he held every prominent position that he could in the county. He was the prime instigator of the Fort Worth Medical School. In the loss of Dr. Adams we lose a man that was one of the brightest stars in the galaxy of medicine. When I say that, I do not think I have said too much. He was a man that was open-handed to his friends, if he ever had an enemy I did not know it. It may be truly said of him that he practiced medicine from his heart;

he never asked if they had the price to pay him—he recognized that they were suffering humanity and needed him. Gentlemen, in the loss of Dr. Adams it was a calamity, not only to his family, but to the State of Texas, because his life was both a blessing and a benediction, and it can be truly said that he died in the harness. He was assisting Dr. Walker until he was so weak that Dr. Walker went home with him and was with him at the end when the last link in his chain was severed, and he laid himself down to dream and his great soul winged its flight, and found the door of heaven.

DR. T. C. OSBORN, CLEBURNE.

DR. F. E. DANIEL, Austin: I had prepared a brief biographical sketch of the distinguished departed brother to whose memory I desire to pay tribute, but having it in my mind that these services were to be held tomorrow, and not at the present time, I left the paper in my room. I will have, therefore, to trust to a few extemporaneous remarks as they come to me, and will not detain you long. I confess to my inability to do justice to the noble character and the eminent services of that distinguished and beloved brother, the grand old patriarch of the medical profession in Texas.

*"If it were given me to select the brow upon which to place the richest crown in heaven's coffers, I could not imagine one more worthy to wear it than that of the gray-haired physician, who, bent with the weight of years, and spent with the toil of arduous duties well performed, turns with weary step to lay himself upon his last couch to rest. As with clean hands and white soul, he awaits the call of an approving God, methinks 'the quiring of immortal harps and swan-like sigh of angel's wings' might be heard, as the spirits of patients, gone before, gather on the banks of the beautiful stream to welcome him home."

I knew Dr. Osborn well. I admired him for his worth, and I loved him for his virtues, his greatness and goodness of heart. He belonged to the old generation of physicians, when the profession of medicine was a "mission" and not a trade; when the physician made no charge for his services, but accepted, as an "honorarium," whatever, if anything, was tendered in acknowledgment of his services. His services were given, alike to rich and poor, without a thought of remuneration. With him it was not a sacrifice, but a duty, to attend to all calls, and to relieve sickness and suffering was his mission. The humblest of God's creatures could call on him without hesitation, and with the full assurance of receiving his prompt and earnest attention. Dr. Osborn, in his whole life and career, exemplified the highest type of the American physician. He was learned, genial, strong, sympathetic, kind. In my mind he stands as a type of character to be

*Note.—From the address of welcome to this Association by Hon. A. H. Graham at the Austin meeting in 1887.

emulated by the younger brethren. He was always studious, painstaking, an accurate observer, and a man of deep research. He stored his mind with knowledge that he might be better able to heal, and for the pleasure, he said to me, that it gave him "to know things." If the good that men do lives after them, the good that Dr. Osborn did in his long, arduous and devoted life will be an enduring monument to his name and fame, and they will go sounding down the ages along with that of the immortal Jenner. His best and most enduring work was in connection with the disease that made Jenner immortal, the prophylaxis of small pox. Of all his work, he was prouder, and justly so, of his discovery of the means of preventing or aborting and thus disarming of its terrors the "red scourge,' by baths of a solution of bichloride of mercury. This treatment, now very generally used, will always be known as the "Osborn method." All honor to the veteran physician, the genial gentleman, the upright, God-fearing citizen; the model father, the delightful and loyal friend, the noble, the good, the gentle, the learned Osborn.

Biographical.

Thomas Crutcher Osborn was born in Nashville, Tenn., May 9, 1818. His father was Alfred Mariott Osborn, a native of Oxfordshire, England. His mother was a daughter of Anthony Crutcher of Tennessee. Dr. Osborn, as a boy, was delicate, and, by the advice of the family physician, he was put to plowing, a small plow being made to suit the height of the young invalid. He grew to be a vigorous, healthy boy at thirteen. Then he went to an old field school; that was all the schooling he had. At eighteen he began the study of medicine. He attended a course of lectures in 1839 and 1840, returned home and began practicing with his preceptor, Dr. W. T. Heatherly. The degree M. D. was conferred on Dr. Osborn by Memphis Medical College in February, 1861, "in acknowledgment of his distinguished services to humanity in the practice of his profession, and on account of the discovery of the symptoms known as 'the Malarial tongue.'" He had been from 1840 to 1861 practicing under a license from the Board of Censors of the Tennessee Medical Society, under the then existing laws of the State. For a complete biography of Dr. Osborn, you are referred to the Southern Practitioner, Nashville, Tenn., January, 1901. It was written by the venerable Dr. Samuel Hollingsworth Stout, late medical director of all the Confederate Hospitals during the Civil War. Drs. Stout and Osborn were life-long friends from boyhood's days. Dr. Osborn's contribution to the storehouse of medical lore, and his services to the profession and to humanity have been immense. He contributed many original and valuable papers to the Medical Journals of the Southwest. He removed from Tennessee to Greenville, Ala., thence to Louisiana, thence to Cleburne, Texas, in 1882.

He was married in 1845 to Miss Harriet McClellan of Alabama. Of their marriage were born four sons and four daughters, all of whom survive him. His son, Dr. James D. Osborn, and his grandson, Dr. E. B. Osborn, well known to you all, are practicing medicine in Cleburne.

Of all the good work done by Dr. Osborn to the cause of medicine and humanity, Dr. Osborn prized most highly the discovery, which will always bear his name, of the prophylaxis and abortion of small pox by the local use of bichloride of mercury. It destroys the colonies of the bacterium *in situ*. He was enthusiastic on the subject, and actually took a case to his home and treated it, permitting the man's wife to sleep in the same bed with her husband all through the case. Just eighteen days before he died he wrote Dr. Stout a characteristic letter from which I extract the following: "I am quite happy to inform you of my great prize in having a case of Variola of the discreet variety in my house since last Wednesday, and that it is aborting beautifully. I have longed for just such a case, not merely to arrest it on the wing, but greatly for the opportunity of testing the prophylaxis of the rational treatment by permitting the husband and wife to sleep together. It is a newly married couple and the test will be therefore the more satisfactory. If they can sleep together as young folks do, the test will be complete and the public need no longer fear infection (the husband contracted the disease on the bridal tour). His wife hurried him to my house. * * * I am so glad to superintend the treatment, knowing well what could be done. Addressing myself to the work, it became obvious after the first sponge bath that its effects were decidedly perceptible, and by the next Sunday morning the multitude of pustules on the face faded out completely, and he was up and dressed, with the freedom of the house and yard. We are directing attention to the wife, who has not been absent from his bed at any time. Can't you see why I'm so glad? If she has no incubation (later reports said she had none) I will let them go home next Sunday, feeling no more solicitude about the dramatic incident. * * * Oh, ain't that splendid? I am so happy. * * * God has had a hand in this, to dispel the apprehension filling my mind, as to the probabilities of my early claims that such contact as in this case might undo my assertions; but that is all gone. I am happy."

Dr. Osborn was an honorary member of this society. His name appears in the Transactions of the Tennessee Medical Society as far back as 1841, nearly sixty years ago. He was President of the Alabama Medical Society and of the Greensboro, Alabama, Medical Society many years; made an honorary member of same in 1852; honorary member of Atlanta, Ga., Academy of Medicine; honorary member Mobile Pathological Society; member American Medical Association, 1869; President Lincoln Bar, Louisiana,

Medical Society and President Johnson County, Texas, Medical Society. He was regarded throughout the Southwest as the patriarch of the profession. Wherever he was known the medical fraternity universally feel that his career has reflected credit upon their profession and redounded to their honor.

DR. B. F. EADS, MARSHALL.

DR. O. M. HEARTSILL, Marshall: My heart is sad from the void caused by the death of Benjamin Franklin Eads, but as Our Father, who does all things for the best, has seen fit to promote our friend and brother, it is with a feeling of joyous pride that I pay this tribute to his memory.

I would feel that I had signally failed in my duty if I spoke no word in praise of this truly large man—I use the word large advisedly. In addition to his magnificent personal physique, he had large ideas for the good of mankind at large. He possessed exceptional individuality, a large, sympathetic heart. He was an unconscious leader among men.

Dr. Eads departed this life February 1, 1903, at his home in Marshall. While he had not been in perfect health for some weeks, his death came as a shock. He wrote a prescription a few hours before his death, thus he died —as he had wished—in harness. He leaves a devoted wife and a son too young to fully appreciate his great loss.

Dr. Eads was of English descent, born March 9, 1833, in Caroline county, Va. He received his literary education at the common schools of his native State, and his professional education at the Universities of Pennsylvania and Virginia. He spent four years at L'Etole de Medicine, Paris, France, perfecting himself in his chosen profession which he so loved, so honored, returning to this country in time to render valuable service to his native State. He served as a surgeon throughout the war of the Confederacy. He was, at the time of his death, and had been for twenty-three years, chief surgeon of the Texas & Pacific Railway Company—the length of time he occupied this difficult and honorable position speaks for itself—is the highest praise that could be spoken, and needs no other words of commendation. It was my proud privilege to serve under him as house surgeon in the Texas & Pacific Hospital at Marshall for five years, and during those, to me, profitable years in practical surgery, there was instilled in my mind and heart a proper understanding of Dr. Eads's true worth. He was always kind and generous in his treatment to his under surgeons, and gave to them freely from the rich storehouse of his knowledge, and it was given in a simple, practical way that we could imbibe and list for future use. His very presence inspired confidence, so capable, so sincere, so sympathetic, the soul of chivalry and honor. Dr. Eads came to Marshall in 1865, and until the day of his death was actively engaged in the practice of medicine. He

was one of Marshall's leading citizens. His moral life was clean, no stain had entered there to darken the horizon that was to crown his setting day.

When his hour came he went without a struggle, doubtless to reap the result of a grand life well spent. He was president of the Harrison County Medical Society; he was a high Mason, having reached the pinnacle of Shriner; a member of the Walter P. Lane Camp of Confederate Veterans; and last, but by no means least, a consistent member of the Episcopal church.

Though we have lost him to our profession and to mortal sight for all this mortal life, yet his great example is ours to abide with us. As a leading surgeon and a man of sterling personal merit he has, for nearly half of a century, been widely known. He always enjoyed a large and lucrative practice, and it was a coincidence that in the immense procession that witnessed the last sad rites there were many tear-stained faces whose first entrance into this world had been gently greeted by Dr. Eads. We look upon him as an honorable example—not dead, but glorified.

DR. W. H. MOORE, BUNGE.

DR. M. M. SMITH, of Austin: It was my pleasure to meet Dr. Moore. He was in attendance at our last meeting in Dallas. He was our honored Orator, and delivered the oration in Dallas. I remember his presence there, and the applause with which he was greeted, and his genial, companionable nature with all men here today. I did not know Dr. Moore personally, but saw him at the Dallas meeting, was there with him, and stayed at the same hotel as he did; met his wife, who accompanied him, and we little thought that this year he would not be with us. It seems since our last meeting that quite a large number of our most distinguished members of this Association have passed from us, and among the list, a number whose place can not be refilled. In fact, gentlemen of the Association, I fear that the older members of the profession whose high ideals and whose conduct at all times are not practiced by the profession—that is, by the younger element of the profession—as much as they should be, there is a tendency, oftentimes, to think that when a man reaches the older years that he is somewhat behind in his professional work. He may not be posted on some of the newer theories, or more advanced subjects, but he possesses within his mind that storehouse of knowledge all that valuable information obtained from practical experience and that old Southern style of good fellowship and well wishes to all members of the profession, that has seemed to die out on account of our rush for money. I regret to see this among the profession, and I hope that when we recall the many noble deeds of those who have gone before us, that it will act as an example to us and

make us, in a small way at least, try to improve upon it, and I take this opportunity to drop one flower upon the grave of our friend and fellow-brother, Dr. Moore.

SECOND DAY.—*Night Session.*

At 8:30 p. m. President Red called the Section on State Medicine and Public Hygiene, and Chairman Frank Paschal, of San Antonio, and Secretary H. W. Crouse, of Victoria, took charge of the Section.

On motion, a recess of fifteen minutes was taken, after which Chairman Paschal read his address.

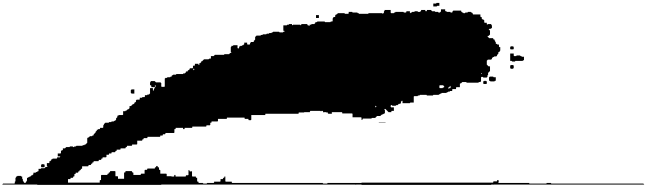
At the completion of Dr. Paschal's address, Dr. Chas. Wardell Stiles, representative of the Marine Hospital Service, read a paper on "The Significance of the Recently Recognized American Hookworm Disease for the Texas Practitioner," with culture slides and microscopic demonstration.

The paper was discussed by Drs. H. A. West, of Galveston; Wm. Keiller, of Galveston; Walter Shropshire, of Yoakum; John T. Moore, of Galveston; H. W. Crouse, of Victoria; Bethel Nowlin, of Jonah; J. M. Nicks, of Stone City; closed by Dr. Stiles.

At the close of Dr. Stiles's paper, "The Tuberculin Test in the Diagnosis of Tuberculosis in Man," by Dr. Boyd Cornick, of San Angelo, was then called.

Owing to the fact that lantern slides were in use in a paper to be read by Dr. John T. Moore, of Galveston, Dr. Walter Shropshire moved that the paper by Dr. Moore be given precedence over the remaining papers in the Section on State Medicine. The motion was carried, and Dr. Moore read a paper entitled "Report of a Case of Tænia Nana in Texas." With the assistance of Dr. Stiles the paper was profusely illustrated by views on the screen.

On motion the Association, at 10:50 p. m., adjourned until tomorrow at 8 a. m.



THIRD DAY.—*Morning Session.*

At 8 o'clock promptly President Red called the Association to order and stated that the first order on the program was the transaction of executive business.

DR. M. M. SMITH said: Before taking up the two reports, I desire to offer a resolution to this effect: That in the meeting of the House of Delegates the other afternoon, Dr. McCormack, who was there as our guest, offered us some resolutions by which the plan of reorganization could be put into effect after the adjournment of this Association. In this resolution that Dr. McCormack has presented, he failed to name a salary for the Treasurer. I therefore desire to make this motion, that the salary of the Treasurer for the next year, in case all the officers are to be re-elected, be allowed to remain as at present.

Motion was put and seconded.

DR. CANTRELL: There seems to be just two things that we have left out that we did not aim to leave out. We tried to make ourselves sufficiently clear in what we said, but Dr. McCormack forgot them in preparing his resolution. One was the salary of the Treasurer; we meant for that to remain the same. I think it would be an injustice to the Treasurer not to pay him. There are a great many members who have not paid their dues, and if he failed to collect the outstanding dues, it would be a real loss to the Association.

The other matter was that of preparing a program for next year. We meant to say in that resolution that the President could get together the Vice Presidents and other officers, and pursue the same methods in preparing a program for next year, as we have in former years. I therefore move to amend Dr. Smith's motion so as to cover that part.

DR. M. M. SMITH: I am willing to accept the amendment that the new organization goes into effect upon adjournment of this meeting. Therefore it really would not be necessary, but I accept the amendment as put by Dr. Cantrell.

DR. S. C. RED: In order to instruct the President how to act in committee to put into effect the new constitution, and meet any deficiencies that might arise in the interim, would it not be well to advise that the incoming President, Vice Presidents and Secretary be authorized to look after the whole machinery of the Association and keep it going?

DR. CANTRELL: I move that the one Nominating Committee fill all the places and make nominations for the State Board of Medical Examiners, as well as for all offices of the Association.

DR. S. C. RED: That was carried at the executive session yesterday morning, i. e., that eighteen names be selected from the members of this Association, to be submitted to the Governor for selection of nine of them as Medical Examiners, same to be chosen by this Nominating Committee.

DR. JOHN T. MOORE: I move that the Secretary of the Association be authorized to furnish the President and Secretary of each county society a copy of the proceedings free of cost for the ensuing year. The expense will be very little for a copy of the Transactions for this year, and it will be a compliment to them.

Having been duly seconded, the resolution carried.

DR. H. A. WEST: There is a standing committee on Medical Society Organization. There will be no necessity for that committee, as organization is in the hands of the councilors. I therefore move that the Committee on Medical Organization be dissolved.

The motion, receiving a second, was duly carried.

Dr. M. M. Smith then reported on behalf of the above committee as follows:

REPORT OF COMMITTEE ON ORGANIZATION OF MEDICAL SOCIETIES.

To the President and Members of the State Medical Association of Texas:

Your Committee on Organization of Medical Societies would respectfully submit the following report: Since the last meeting of the State Medical Association held in Dallas, the organization of new medical societies in the State have been held in abeyance, awaiting the action of the Association at this meeting on the plan of reorganization in accordance with the recommendations of the American Medical Association.

We are pleased to say that this Association has adopted in full the recommendations of the American Medical Association, which has as the unit of organization the county medical society, and the only way any one can become a member of the State or American Medical Association is to first join the county society. The adoption of this plan of reorganization of this Association, we believe, will quadruple the membership of this Association within the next two years, and as a result the entire profession of this State will be brought closer together and all the illegitimates will be detected, and made to comply with the law, or leave for other pastures green.

In accordance with a resolution adopted, with the plan of reorganization, the council of fifteen members has been appointed to organize county medical societies during the year, in their respective geographical districts, in accordance with the new plan. We therefore suggest that this committee

be discontinued, but earnestly urge every member of this Association to endeavor in every possible way to aid this council in the performnace of their arduous duties.

Respectfully submitted,

S. R. BURROUGHS,
J. H. EVANS,
T. J. BELL,
J. E. GILCREEST,
W. R. BLAILOCK,
C. M. ALEXANDER,
P. C. COLEMAN,
M. M. SMITH.

Dr. M. M. Smith then offered the following report of the Board of Medical Examiners, and in his introduction spoke as follows:

In making our report for the Medical Examiners, owing to the sudden illness of Dr. Wilson, we are not able to present a report in keeping with this Association and in keeping with the report made at our last meeting from this committee. At our last examination we had ninety-seven applicants, and I have not been able to make that report out in detail as I would like; there are some tabulated statistics and some other data that I will furnish at a later date to the Secretary.

SUPPLEMENTARY REPORT OF THE BOARD OF MEDICAL EXAMINERS FOR THE STATE OF TEXAS.

To the President and Members of the State Medical Association of Texas:

We beg leave to submit for your consideration the work accomplished by the Board of Medical Examiners for the State of Texas, since our last report one year ago, and a brief tabulated report of all the work performed by the board since its organization under the new medical law in Texas, which became effective on July 9, 1901.

Number of applicants who have appeared for permanent examination since last report, 179; total number who have passed successful examinations since the last report, 153; total number who failed to pass the examinations, 26. Total number of temporary examinations given since last report, 17; total number who passed, 16; total number who failed to pass examinations for temporary certificates, 1. Total number of reciprocity licenses to physicians from other States since last report, 20. The number of licenses issued to those whose diplomas have been registered in the office of the district clerk, on certificates of deans of colleges since January 1, 1891, and from district clerks as to registration, since last report, 324. Total amount of money received by the board since its organization to the

present time, $3375.05. Total amount of expenses of the board since its organization, $1061.15, leaving a balance of $2313.90, which has given a dividend of $257.10 to each member of the board as compensation for his time, hotel bills, traveling expenses and other labors since the organization of the board.

At the organization of the board it was decided that each member should pay his own traveling expenses and hotel bills, as they would be about equalized, owing to the different places of meeting, and by this means the actual expense account herewith was very materially reduced, thereby enlarging the amount of dividend declared.

We desire to assure this Association, in making this, our last report, that we shall ever hold in remembrance the uniform and united support it has given us at all times in the performance of our duties. We have endeavored in all of our examinations to test the qualifications of the applicants; to make the questions upon the different branches practical and suitable to make a fair test of the qualifications of the applicants.

THOSE WHO PASSED SUCCESSFULLY PERMANENT EXAMINATIONS BEFORE THIS BOARD, AND RECEIVED THEREFROM CERTIFICATES.

Four examinations have been held for permanent certificates, as follows: Austin, October 1, 2, 3 and 4, 1901, with five applicants, four of whom passed, and one failed; the percentage of failures being 20 per cent.

Waco, Texas, May 13, 14, 15 and 16, 1902, with fifty-seven applicants, forty-eight of whom passed, and nine failed; the percentage of failures being 18.29.

Dallas, Texas, October 7, 8, 9 and 10, 1902, with twenty-six applicants, eighteen of whom passed successfully, and eight failed; percentage of failures being 30.77.

The last meeting was held in Austin, Texas, April 20, 21, 22 and 23, 1903, with ninety-seven applicants, and of this number one applicant for examination in midwifery, who failed to get the required percentage. Of the other ninety-six, eighty-seven passed, and nine failed, which gives a percentage of 10.37 of failures. Adding together all of those who have passed the board successfully, we have 157; those who have failed 27, making a general percentage of failures for the entire time of 14.85.

RECIPROCAL RELATIONS WITH OTHER STATES.

The board, soon after its organization, appointed a committee to examine the medical laws of the different States, and make a report of those States whose requirements were as high as those of Texas, and thereby could be placed on reciprocal relations with Texas, which were as follows:

Delaware, District of Columbia, Georgia, Iowa, Louisiana, Maryland, Mississippi, Missouri after July 1, 1901, Montana, Nevada, New Hamp-

shire, New Jersey, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Utah, Virginia, Washington; total 20. This board, under this clause of the law, has issued a total number of reciprocity certificates of 34, as follows: Georgia, 8; Iowa, 1; Louisiana, 5; Maryland, 3; Mississippi, 2; Missouri, 3; North Carolina, 1; New York, 5; Pennsylvania, 1; South Carolina, 2, and Virginia, 3.

TOTAL NUMBER OF CERTIFICATES ISSUED TO PHYSICIANS WHOSE DIPLOMAS FROM REPUTABLE MEDICAL COLLEGES WERE PLACED ON RECORD IN THE OFFICES OF THE CLERKS OF THE DISTRICT COURTS OF TEXAS, BETWEEN THE FIRST DAY OF JANUARY, 1891, AND JULY 9, 1901, THE SAME BEING GRADUATES OF NINETY-NINE DIFFERENT MEDICAL COLLEGES, AS FOLLOWS:

Medical Department University of Alabama	14
Atlanta College of Physicians and Surgeons, Georgia	67
Atlanta Medical College, of Georgia	8
Southern Medical College, Atlanta	1
Medical College of Georgia	5
Northwestern Medical School, Illinois	6
Rush Medical College, of Illinois	12
Chicago College of Physicians and Surgeons, Illinois	3
Illinois Medical College, of Illinois	1
Bellevue Hospital Medical College, New York	16
Medical Department University of Buffalo	1
College of Physicians and Surgeons, New York	5
Medical Department University of City of New York	2
Long Island Hospital Medical College, Brooklyn, N. Y	2
Medical Department Cornell University	1
Indiana Medical College, Indiana	3
Fort Wayne Medical College, Indiana	1
Physio-Medical College	1
Toledo Medical College, of Ohio	1
Medical College of Ohio	15
Medical Department Western Reserve University	1
Cleveland College of Physicians and Surgeons, of Ohio	1
Medical Department National Normal University, of Ohio	1
Cincinnati College of Medicine and Surgery, Ohio	1
Starling Medical College, of Ohio	2
Medical Department University of Virginia	6
University College of Medicine, Virginia	2
Medical College of Virginia	1
Medical Department University of Michigan	8
Detroit College of Medicine, of Michigan	3

Saginaw Valley Medical College, of Michigan	1
Keokuk Medical College, Iowa	4
Medical Department University of Iowa	1
Keokuk College of Physicians and Surgeons, of Iowa	2
Medical Department Howard University, District of Columbia	4
Medical Department University of Georgetown, District of Columbia	1
Medical Department National University, District of Columbia	2
Medical Department Columbian University, District of Columbia	1
Medical Department University of Arkansas	12
Medical Department University of Vermont	2
Tennessee Medical College, Tennessee	2
Medical Department University of the South, Tennessee	11
Chattanooga Medical College	13
Meharry Medical College, of Tennessee	29
Medical Department University of Nashville	38
Medical Department University of Tennessee	75
Medical Department Vanderbilt University	95
Memphis Hospital Medical College	152
Louisville Medical College, Kentucky	75
Medical Department University of Louisville, Kentucky	90
Kentucky School of Medicine, Kentucky	80
Hospital College of Medicine, Kentucky	19
Medical Department Central University, Kentucky	9
Texas Medical College and Hospital, Texas	1
Medical Department University of Dallas, Texas	6
Medical Department Fort Worth University, Texas	34
Medical Department University of Texas	108
Medical Department New Orleans University, Louisiana	5
Medical Department Tulane University, Louisiana	134
St. Louis College of Physicians and Surgeons, Missouri	35
Beaumont Hospital Medical College, Missouri	10
Marion-Sims Medical College, of Missouri	10
Marion-Sims-Beaumont Medical College, Missouri	2
Medical Department Washington University, Missouri	31
University Medical College, Missouri	6
Barnes Medical College, Missouri	30
Ensworth Medical College, Missouri	3
Missouri Medical College, Missouri	6
St. Joseph College of Physicians and Surgeons, Missouri	1
Kansas City Medical College, Missouri	4
Medico-Chirurgical College, Missouri	1
St. Louis Medical College, Missouri	1

Columbian Medical College, Missouri	1
Baltimore College of Physicians and Surgeons, Maryland	18
Baltimore Medical College, Maryland	6
Baltimore University School of Medicine, Maryland	2
Medical Department University of Maryland	5
Washington University School of Medicine, Maryland	2
Medical Department University of Pennsylvania	11
Woman's Medical College, Pennsylvania	1
Jefferson Medical College, Pennsylvania	22
Western Pennsylvania Medical College, Pennsylvania	2
Gross Medical College, Colorado	2
Medical Department University of Denver, Colorado	1
Omaha Medical College, Nebraska	1
Creighton Medical College, Nebraska	1
Kansas City Medical College, Kansas	1
Leonard Medical School, North Carolina	1
Medical University of South Carolina	1
Medical Department Yale University	1
University of Zurich, Switzerland	1
University of Dorport, Russia	1
University of Erlangen, Germany	1
University of Bonn, Germany	1
University of Vienna, Austria	1
University of Toronto, Canada	2
Trinity Medical College, Canada	1
Royal College of Physicians and Surgeons, Canada	1

The tabulated results by States are as follows: Alabama, 14; Georgia, 39; Illinois, 22; New York, 27; Indiana, 6; Ohio, 22; Virginia, 9; Michigan, 12; Iowa, 7; District of Columbia, 8; Arkansas, 12; Vermont, 2; Massachusetts, 1; Tennessee, 424; Kentucky, 273; Texas, 149; Louisiana, 139; Missouri, 140; Maryland, 32; Pennsylvania, 36; Colorado, 3; Nebraska, 1; Kansas, 1; North Carolina, 1; South Carolina. 1; Canada, 4; Switzerland, 1; Germany, 2; Austria, 1, and Russia, 1.

Respectfully submitted,

J. T. WILSON,
SAM R. BURROUGHS,
J. W. SCOTT,
J. H. REUSS,
F. PASCHAL,
J. C. JONES,
J. H. EVANS,
D. J. JENKINS,
M. M. SMITH.

The report was received.

DR. M. M. SMITH: That the members of this Board, as a whole and individually, desire to express our earnest and sincere thanks to this Association, and to its individual members for their uniform courtesies and assistance at all times in the performance of their duties. I desire further to say that in making this, our last report the profession throughout the State have always given us their hearty support and assistance at all times, and that we have worked along without a single jar or anything unpleasant in the performance of our duties.

DR. H. A. WEST: I would like to know how many second-course students have received a license to practice from this Board? I do not see any record made in regard to such cases. It has come to my knowledge, however, that a number of second-course students from the Medical School of the University of Texas have been granted licenses to practice.

DR. M. M. SMITH: I think I can furnish that data to the Board in the morning in relation to those who are graduates, who are undergraduates and the length of time they have been in college. I will furnish this at the executive session tomorrow.

DR. H. A. WEST: There must be something radically wrong in the methods pursued by the Board of Medical Examiners when they grant licences to practice to second-year students. There appears to be a conflict between the Board of Examiners and the authorities of the University of Texas, for the latter institution requires four years of study to complete the course. Second-year students are not allowed to attend the clinics nor do they study any of the practical branches; they are not supposed to know anything about the practice of medicine, obstetrics, surgery, gynecology or any other matters of practice. How they can be properly prepared to be turned loose upon the community to practice is a thing beyond my comprehension.

I would like to hear from some one else in regard to this important subject. It seems that some steps should be taken to harmonize the Medical Board with the other State institution, the University of Texas.

Dr. Frank Paschal then spoke on the subject as follows:

As a member of the Board of Medical Examiners, I wish to say that the questions employed are, as a rule, practical questions. That many of the members here present were only required to attend a two-years course of lectures when they received their degree. I do not say that the method of teaching now is better or worse than the old method of teaching when we were medical students, and graduates of medicine. One thing I would like this body to inquire into, is whether the percentage of rejections that have been made by this Board is higher or lower than the percentage of

those who are rejected in the different medical schools of the United States. Under the law we have no option whatsoever; any one of good moral character can come up before our Board for examination, and hand in his papers for us to act upon. We do not know who they are. When I was grading papers, for instance, of the ninety-seven men who were up last week in Austin before the Board, I did not know the numbers of even three of these gentlemen. Their papers are numbered, not named, and we grade them by their numbers. If the applicant knows enough to answer the questions intelligently, and to the satisfaction of the Board, I do not see wherein the Board is to be blamed for passing men who have only attended a two-years course of lectures. I do not say that we are infallible in grading our papers; some papers are possibly graded higher than they should be; but whenever an applicant has failed to pass, you will find that the grading of each member of the Board of that applicant's papers has been uniformly low, showing that the members of the Board have realized that the answers to their questions is a fair representation of the applicant's knowledge.

I believe that this law should be so amended that when an applicant applies to this Board for an examination he should present a diploma from some reputable school of medicine. The law, as it now stands, does not require this, hence we can not be responsible for those who come before the Board.

DR. WM. KEILLER: I am one of the two professors of the Medical Department of the University of Texas who had a somewhat unique experience. It was this way: we had neglected to register our certificates and had the pleasure of appearing before your Board of Examiners last year. I think it was the hardest work we ever had before in all the ten years that I have spent in Texas. They kept us there for three days, writing all the time. Both Dr. Carter and myself had writer's cramp, and I have learned something about it. I believe we had a form that is dependent upon exhaustion of the centers on the cord for the brachial plexus (where I had the pain was at the back of my neck).

The questions, as a whole, were well selected, but there were too many of them. I have reason to believe that the grading is not sufficiently severe, and precautions are not taken against copying.

The profession in Texas owes a debt of gratitude to the Board for their arduous labors.

DR. H. A. BARR: As far as I know the work of this Board may be all right, but there are a few things I would like to know. It was supposed when this law was enacted that is was the intention of this Board to make a high standard and raise the plane of the medical profession. The Texas State Medical Association has a right to know how much has been done by

this law, if anything. Now, it is a well-known fact that of the practitioners of this State who have complied with this law 95 per cent of those physicians who have passed this examining board had complied with the law anyway. If I'm rightly informed, very few of those who were not complying with the law have gone before this Board. To my knowledge, little has been done to force them to comply with the law as it now stands.

DR. E. E. GUINN: "Dr Barr wants to know what the Board is doing towards setting aside those fellows who are practicing upon certificates from district boards before our present State law became a law."

It is my understanding that this Board has nothing to do with these fellows, except to receive and register their certificates; this has been fixed by the law itself. In regard to illegal practitioners, it is as much the duty of each physician in this State to see to the prosecution of these men as it is the Board's; unless these facts are furnished to the Board, by the physicians of the State, it will not get them.

DR. M. M. SMITH replied as follows: I would like to reply to one or two questions. In reference to this new law as to whether or not, as Dr. Barr, of Beaumont, says, we are doing anything or have not done much, or something to that effect. I desire to say in this respect that we had one or two district boards in this State that simply sold State district board certificates to whoever had the price of them; this law has stopped all that, and we have very few illegal practitioners in this State at the present, and this Board asked if they had complied with the law and they replied and asked us for our authority, and we asked the Attorney-General if we had the authority to bring these violators to justice, and he replied that we had nothing to do with bringing these violators to justice further than as individual members, at the expense of the county where such violators lived. Therefore, if we have violators in this State same is due to lack of interest in those respective counties where they live.

That with our present plan and with a good county society in each county in this State, and with the assistance of the Board and co-operation of all the physicians, we will be able to bring these parties to justice.

DR. J. D. OSBORN: This Association owes a debt of gratitude to that Board of Medical Examiners. A vote of thanks is little remuneration for the arduous work it has accomplished, and the best evidence that we have had on the subject, as Dr. Keiller testifies, is the work they gave him; therefore,

Resolved, That the State Medical Association return a vote of thanks for this report and for the work they have done, and say to them: "Well done, thou good and faithful servants; go on in the good work."

Carried.

Dr. F. E. Daniel, as Chairman of the Committee on State Board of Health, read his report of the workings of the Board for the past year.

REPORT OF CHAIRMAN OF COMMITTEE ON STATE BOARD OF HEALTH.

As chairman of your Committee on State Board of Health, I beg to report that in accordance with instructions there was prepared an elaborate bill for a State Board of Health and Vital Statistics—on the same lines as the Harrison bill, which was approved by this body at our last meeting—but, as there was an irreconcilable division of your committee upon its most essential and vital features (those that made it acceptable to the Quarantine Department), it was not introduced in the Legislature, previous experience having taught us that any measure antagonistic to the existing status would surely be defeated. There was amongst the members of both houses a pronounced sentiment against a Board of Health, and an outspoken and demonstrated opposition, even on the part of the committees on Public Health, to creating any new office or offices with salary, and necessitating additional appropriation. It was not deemed wise to repeat the efforts of the past, which have always been defeated, as we felt assured from expressed sentiments by leading Senators and Representatives that we could not even get a favorable report from the Public Health committees.

The alternatives presented to us were: either to abandon all efforts, and let the matter go over another two years; face again certain defeat, or endeavor to secure a vital statistics law and sanitary legislation by the only method that seemed to offer any chances for success. Availing ourselves of the discretion demanded by the situation, we chose the latter alternative. We prepared another bill similar to the first in all essentials, except that instead of having a Board of Health to administer the proposed sanitary laws, the authority was vested in the State Health Officer, as is all authority in quarantine matters, subject to the Governor's sanction.

This measure was introduced in the Senate as the action of the majority of your committee, referred to the Senate Committee on Public Health, and was reported favorably, with the recommendation that it do pass. It was never acted upon in either house.

In the interest of harmony in the Association, I deem it wisest and best to not enter into detailed explanation. We respectfully ask to be discharged from further consideration of the matter. The two bills referred to are herewith attached and are a part of this report.

Respectfully submitted,

F. E. DANIEL,
Chairman.

Dr. Orr moved that the report be received and the committee discharged.

The motion was carried.

Judicial Council was called for.

Dr. M. M. Smith then offered the following resolution:

WHEREAS, The Hon. Jos. D. Sayers, ex-Governor of the State of Texas, recognizing the importance and necessity of a medical law in the State of Texas, regulating the practice of medicine, surgery and midwifery, incorporated in his annual message to the Legislature of the State of Texas, while Governor of the State, the recommendation for the enactment of such a law; and

WHEREAS, During the last session of the Legislature a new medical law was enacted in this State, and approved by the Hon. Jos. D. Sayers, as Governor; therefore, be it

Resolved, As he is a resident of San Antonio, that the privileges of this floor be tendered ex-Governor Sayers, and that a committee of three be appointed to invite him to visit this meeting and favor us with his wise counsel.

The resolution was adopted and the following gentlemen were appointed by Dr. Red as a committee to wait on ex-Governor Sayers and escort him to the hall: Drs. M. M. Smith, S. T. Turner and Taylor Hudson. [The ex-Governor was not, however, to be found. —EDITOR.]

The Section on Gynecology was then called, and owing to the absence of the Chairman and Secretary, Dr. Geo. H. Lee, of Galveston, was called to the chair, and Dr. Hill, of Austin, was called to act as Secretary.

The Judicial Council reported a list of new members.

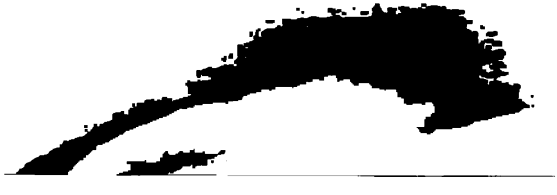
Upon motion, the report was duly adopted.

Dr. Geo. H. Lee then read his paper entitled "Some Observations on the Anatomy, Physiology and Repair of the Pelvic Floor."

Discussed by Drs. Cantrell and Paine, and closed by Dr. Lee.

The Section on Ophthalmology, Otology, Rhinology and Laryngology was then called, and Dr. Henry C. Haden, of Galveston, took the chair, with Dr. W. A. Harper, of Austin, as Secretary.

Dr. Haden read his address as Chairman of the Section.



"Adenoid Vegetations in the Naso-Pharynx of Children" was the title of a paper read by Dr. Clarence Warfield, of San Antonio.

Discussed by Drs. W. A. Harper, of Austin; J. C. Loggins, of Ennis; W. Rape, of Victoria; John T. Moore, of Galveston; H. C. Haden, of Galveston; and closed by Dr. Warfield.

The Section on Dermatology was then taken up, and Dr. W. B. Russ was called to preside. Owing to the lack of time Dr. Russ did not read his address as Chairman, but called on Major Chas. F. Mason, U. S. A., to read a paper entitled "Dhobie Itch."

Discussed by Drs. Boyd Cornick, of San Angelo, and John T. Moore, of Galveston.

No other papers to be read in this Section, after several announcements had been made, the Association adjourned to meet at 2 p. m. at the Grand Opera House.

THIRD DAY.—*Afternoon Session.*

Promptly at 2 p. m. the Association was called to order by Dr. Red, President of the Association, at the Grand Opera House.

The following Nominating Committee was then handed to Secretary West:

First District.—Dr. J. A. R. Moseley, Jefferson.
Second District.—Dr. E. E. Guinn, Jacksonville.
Third District.—Dr. Jas. Orr, Terrell.
Fourth District.—Dr. J. R. Nichols, Greenville.
Fifth District.—Dr. A. F. Lumpkin, Meridian.
Sixth District.—Dr. J. M. Nicks, Stone City.
Seventh District.—Dr. E. W. Link, Palestine.
Eighth District.—Dr. J. B. Burditt, Bellville.
Ninth District.—Dr. W. Moore, La Grange.
Tenth District.—Dr. T. J. Bennett, Austin.
Eleventh District.—Dr. Taylor Hudson, Belton.
Twelfth District.—Dr. J. D. Osborn, Cleburne.
Thirteenth District.—Dr. W. P. Pennington, Justin.
Fourteenth District.—Dr. B. F. Kingsley, San Antonio.

Fifteenth District.—Dr. H. J. Hamilton, Laredo.
Sixteenth District.—Dr. S. T. Turner, El Paso.

Secretary West then read the following telegram:

CHICAGO, ILL., April 30, 1903.

Dr. H. A. West, Secretary Texas Medical Association, San Antonio, Texas:

Congratulations. Louisiana, Illinois and Nebraska yesterday adopted constitution practically unchanged.

GEO. H. SIMMONS,
Secretary American Medical Association.

The Section on Pathology was then called, and Dr. A. J. Smith took the chair, with Dr. J. M. Frazier as Secretary.

Dr. Smith then read his address, as Chairman, entitled "The Advisability of a More Definite Course of Instruction in Physics in the Medical Curriculum."

After the conclusion of Dr. Smith's paper "The Fermentative Theory of Infection and Immunity" was the title of a paper read by Dr. J. W. McLaughlin, of Galveston.

Executive business was called, and Dr. West called up the resignation of Dr. Taylor, of New York, as follows:

Dr. H. A. West, Secretary Texas State Medical Association, Galveston, Texas.

DEAR SIR: Since the adoption by the National Association of a rule making it obligatory that its members shall form affiliations with the local corresponding societies in their place of residence, it no longer seems proper or desirable that I shall continue my relations with your Association while a resident of New York. I am, therefore, obliged to trouble you to offer my resignation as a member of the Texas State Medical Association.

Much regretting the necessity of this step, I am

Sincerely yours,

T. M. TAYLOR.

The resignation was accepted.

Dr. H. A. West then read the following resolution, which, on motion, was referred to the following committee: Drs. West, Jackson and Daniel. This committee subsequently making a favorable report, the resolutions were unanimously adopted:

WHEREAS, The United States government, through Surgeon-General Walter Wyman, in correspondence with United States Senator Carmack, at the

instance of the International Quarantine Bureau, J. M. Lindsley, M. D., President, under date of February 17, 1903, has declared that Cuba is not now considered infected with yellow fever, nor was that island thus infected in 1902; and

WHEREAS, The quarantine regulations and requirements enforced during the season of 1902 at Southern ports of entry, in the United States, were practically an embargo, in effect, against freedom of commerce and travel from Cuba to United States ports; and

WHEREAS, The convention held January 26, 1903, at Galveston, Texas, by the representatives of the Boards of Health of the States of Texas and Louisiana and Mobile, Ala., adopted a set of quarantine regulations to be enforced during the season of 1903, which regulations require the disinfection of vessels, passengers and baggage, at the Cuban ports of departure, and also that the vessels and passengers shall be disinfected at the quarantine station on arrival at the United States port of entry; and

WHEREAS, The regulations referred to in the immediately preceding preamble are to be enforced whether infection from yellow fever exists or not, and even though no yellow fever exists on the entire island of Cuba, much less at the immediate port of departure; and

WHEREAS, The United States quarantine regulations require a bill of health from all vessels sailing from any foreign port, whether infected or not infected, for United States ports. This bill of health is signed by the United States consular office, setting forth the health conditions at the port of departure and the sanitary conditions of the vessel, cargo and crew. This bill of health is all that is required from vessels coming from uninfected ports, provided they arrive in good sanitary condition; therefore, we, the undersigned citizens, do hereby petition the various Gulf State Boards of Health to adopt the regulations for the season of 1903, as laid down by the Public Health and Marine Hospital Service of the United States, thus giving open quarantine with Cuba, until such time as Cuba may become infected with yellow fever.

Dr. Crouse then read the following resolution:

WHEREAS, There has been called to our attention the unfortunate, unsatisfactory and unsafe method of conducting the business of the American Medical Association by a few men meeting in the city of Chicago, after the adjournment of the regular meeting of the American Medical Association each year; and

WHEREAS, It appears that there is no national recognition of this representative body of physicians of the United States, nor even of any State, except under general laws; therefore, be it

Resolved, That there be selected a committee of five members of the State

Medical Association, who shall attend the next annual meeting of the American Medical Association, for the purpose of using every possible proper effort to secure the required action on the part of the national body toward a national charter from the Congress of the United States; and the regular delegates in the House of Delegates from this State organization are hereby instructed to vote in favor of such a resolution, and use their best endeavors toward its passage.

Dr. Daniel asked who were the authors of the resolution and what was the object of said resolution, to which Dr. West replied as follows: I wish to state in explanation of the resolution offered by Dr. Crouse that it was sent to me by Dr. F. H. Wiggin, of New York, for endorsement by our Association. If the Association does nt understand the matter properly, it can be passed, as it will be taken up in New Orleans before the House of Delegates of the American Medical Association.

DR. CROUSE: I know nothing about this, and was simply asked to read this. Candidly, it looks like a fight between the New York Medical Society and the American Medical Association to me. I do not think that we have any right to take any part in this matter. We have accomplished a little bit in reorganization and settling of several difficulties at this meeting, and the best thing, it seems to me, for us at the present time, it not to take this up, but instead to state to them that further investigation is necessary before we interfere.

Motion was tabled.

Dr. West then reported as Delegate to the A. M. A. as follows:

I wish to make a brief verbal report as your delegate to the House of Delegates of the American Medical Association, which met last year at Saratoga. This House of Delegates was a fine body of men, and considering the enormous amount of business which was brought before them it was transacted with remarkable success. If any fault could be found it was that too little time was allowed for discussion, as this was the first meeting and so many important matters were presented.

Your delegate was honored by being appointed upon the Business Committee for the coming year; to this committee all new business is referred. I considered this honor was bestowed rather upon the State of Texas than upon your delegate individually. I will also state that I was made a member of the Committee on Public Health, on Transportation and Place of Meeting; these committees are permanent.

As you remember I was elected for two years, hence there will be no occasion to elect a delegate at this meeting. I trust, however, that by next year instead of one we will be entitled to at least three or four.

Dr. Daniel asked unanimous consent to take up the paper of Dr. Morris in the Section on Pathology, to which objection was offered.

The recall of Sections was then had and General Medicine was taken up. The first paper called was "Sporadic Cerebro-Spinal Meningitis," by Malone Duggan; same was read by caption and referred to the Publishing Committee.

Dr. J. H. Evans, of Palestine, read a paper entitled "Pneumonia and Its Treatment," which was discussed by Drs. F. D. Garrett, of Gainesville; S. C. Red, of Houston; T. P. Weaver, of De Leon; M. M. Smith, of Austin; Frank Paschal, of San Antonio; H. A. West, of Galveston; C. E. Cantrell, of Greenville; J. T. O'Barr, of Ledbetter; J. H. McCracken, of Mineral Wells; Bethel Nowlin, of Jonah; J. T. Orr, of Terrell; and closed by Dr. Evans.

"Some Observations on the Treatment of Pulmonary Tuberculosis in Private Practice" was the title of a paper then read by Dr. H. J. Chapman, of San Antonio.

Dr. Chapman's paper was discussed by Drs. M. M. Smith, of Austin; McGregor, of Laredo; H. W. Crouse, of Victoria; Boyd Cornick, of San Angelo; and closed by Dr. Chapman.

This closed all the papers in the Section on General Medicine, and, after a few words of thanks by Chairman John T. Moore, the Section on Obstetrics and Diseases of Children was called.

Dr. C. E. Cantrell, in the absence of the Chairman, took charge of the Section and read his paper, entitld "Some Thoughts on the First Stage of Labor," which was discussed by Dr. Crouse, of Victoria.

Adjourned until 8 p. m., on motion of Dr. Paschal.

THIRD DAY.—*Night Session.*

At 8 o'clock the Association met at the Grand Opera House, where Dr. Frank Paschal, as Chairman of the Committee of

Arrangements, appeared before the audience, which, in addition to the members of the Association and their ladies, contained a large number of citizens of San Antonio, and stated that custom demanded that the President deliver at this hour his annual address, and in conformity with that custom he would introduce Dr. S. C. Red, who, as President of the State Medical Association, would now address the audience. Dr. Red then spoke as follows:

PRESIDENT'S ADDRESS.

Members of the State Medical Association, Ladies and Gentlemen:

It is my purpose, this evening, to give you a medical view of some topics of the day. You well know that it is the habit of people of education and refinement to take a many-sided view of all topics, and by that means arrive more nearly at the exact truth than by any other process. This habit of theirs makes them, as it were, the balance wheel of society. They do not easily run off after new things, and take a cautious view of new subjects before adopting them. They seldom grow especially enthusiastic about anything and consequently become more critics than producers. It is to this spirit of criticism then that I submit a medical view of the following subjects, viz.: Dowieism, Osteopathy, Temperance, and Christian Science. They might be loosely classified as male and female: for the first two are associated with Dowie and Still and the last two with Woman's Christian Temperance Union and Mrs. Eddy.

Dowieism is a term used to express the tenets and practices of the followers of J. A. Dowie. Dowie is a Scotch preacher of extraordinary intellectual activity and power. He first went from the land of his nativity to Australia and while there evinced such skill as a preacher and reformer that he decided to start a church of his own. He proclaimed himself "Elijah returned to earth," and succeeded in getting a lot of people to accept his claim. Australia became too small for his operations, and he decided to go to London. On the way over, he passed through Chicago and found it so much to his liking that he decided to stop there. His Scotch

instincts made a financier of him. You know it is said of the Scotch, "that if there is anything good, you will find a Scotchman either sitting on it or very near by." Dowie saw an opportunity to grow rich off of the credulity of his followers, and subsequent events show that he availed himself of it. He is fanatical in his slavish, literal interpretation of the scriptures, and thereby exacts a tithe or a tenth from all of his followers. Through the use of this tithe and the further control of his people's funds, he has become a financial power, so much so as to build a city, Zion City, with a population of perhaps 10,000 people. It is not his faculty of leader and financier that we have so much to deal with as his claim as a healer of the sick. A reference to them, however, abundantly shows what prestige anything that he might suggest or say would have with his subjects, for they are in fact such. He claims that the Bible teaches that by prayer, the laying on of hands and anointing with oil, the sick are healed. This claim seems to be justified in the report of many wonderful cures. Admitting that these cures take place, and we as physicians do not deny it, how is it to be accounted for? Now, just one moment, while I explain a little: Two elements enter into the cure of certain functional troubles, viz.: mental impressions and the recuperative powers of nature. Every physician is aware of the hope and encouragement that his presence brings to the sick. And ofttimes a little encouragement on his part is all that is really needed. He, however, in such cases sometimes gives medicine to increase the mental effect and not for any direct effect that it might exert. The remaining element, viz.: the recuperative powers of nature, is so familiar to you all as really to need no comment. Every one has experienced the wearing off, in time, of ill-feelings, even though nothing were done. There is also another large class of germ diseases, self-limited as to time, uninfluenced, save as to the comfort of the patient, by any kind of medicine. These classes of disease then would, to the ignorant, give color to Dowie's claims that diseases are healed by faith and the laying on of hands. He is entirely too shrewd to proclaim himself a divine healer. His patients must have faith.

This element of faith enables him to say, when his patients die (and they certainly do), that they did not have faith. You can readily see, then, how such a strong personality as Dowie's would impress his patients; how he would inspire them with hope and put new life into their flagging nerves. "He is Elijah come back to earth; the man that raised the dead. If he raised others, why not me?" the patient would say. But you say that some of his followers were not ignorant. How about them? He has business men and financiers of recognized worth among his followers. Would they be imposed upon? Yes; it has been my observation that it is only the cultured few that know much or anything concerning matters outside of their own calling or occupation. We have this then to say of Dowie. He does benefit some people, but does so ignorantly or fanatically, and, like a great many other systems and styles of cure, stops too soon. In my judgment, he ought to be restrained, for it is nothing short of criminal to treat such troubles as burns by prayer and the laying on of hands.

Dr. A. F. Still, father and patron of Osteopathy, has established a school at Kirksville, Mo., that now claims over fifteen hundred graduates. Dr. Still states that he is a regular graduate in medicine, and that through long years of experience and experiment, has arrived at conclusions considerably at variance with established means of cure. His is "nature's cure." In 1874, the dawn of a new intelligence began to shine into the midnight of his knowledge, filled only with sable-robed goblins of established methods. The "new intelligence" had so far grown by 1892 that he felt safe in opening, in a modest way, a school by means of which he could impart, to searchers after light, all that had come to him. This school now has property and buildings valued at one hundred thousand dollars, and is doing a flourishing business. A few days ago I called upon a representative of this school, living in Houston; a pleasant gentleman, and courteous, indeed. I told him frankly that I had come to seek information about his beliefs and methods of cure. He gladly gave me some of his literature, bearing upon this particular subject, and talked in an animated

way about his reception by the physicians of Houston, the effort at legislation made by this Association, and quack(?) Osteopaths that are degrading the profession. Much to my surprise, I found his library filled with standard medical works of the best authors on every subject, except therapeutics. He stated that students of the Kirksville school are required to take a four-years course, of five months each, and expected soon to lengthen it to seven. Their catalogue calls for four years, and specifies text-books of standard authors, except only in therapeutics. I have taken time to carefully read their teachings on therapeutics, and find much therein worthy of comment. The work as a whole sounds like the plea of a lawyer for his client. Many references are made therein to the failures and shortcomings of medical men (they are not medical men, you know); their lack of care in searching for the causes of diseases and antiquated methods of treatment. The superiority of osteopathic methods is pointed out and cases cited to prove their point. It is not written as a set of facts, but as a plea; not as by one having authority, but as by one seeking to be heard. They are entitled to credit for their knowledge of anatomy, especially of the nervous system, and evident familiarity with other branches of medicine. Their book is more like an incomplete quiz compend than a systematic treatise, and is entitled to be ranked as such. Their cry all through the book is to look for the cause and treat that. This, of course, is laudable and not new. Another subject on which they lay great stress is the stimulation and inhibition of the nerves by pressing and rubbing. This, of course, is laudable but not new. Another thing their book claims, but does not prove, is that many ills are due to the dislocation of the bones of the spinal column and ribs. No X-ray pictures, before or after treatment, are submitted as evidence of what they claim. They treat surgical cases according to surgical methods. To my great surprise, they treat stomach ache by pressing the knee in the back and pulling the raised hands backward. Diphtheria is cured (?) by rubbing the neck. Typhoid fever is cured by seeing the patient, to give a rubbing every fifteen to twenty minutes, cold baths and

liquid nourishment. Granulated lids are rubbed with oil on the fingers, i. e., the inner side of the lids, no cocaine or anæsthetic of any kind being used. Ativism must have asserted itself in one instance, i. e., habits of a long line of ancestors, for quinine is recommended for malaria. This is the only instance where I found a drug of any kind recommended for any ailment. We, as physicians, can and do recommend nerve stimulation and inhibition by rubbing and pressing; we instruct the giving of massage and manipulation of tissues, every day; but we do not stop there. This will benefit some and cure other troubles, but the number is limited. If it is coupled with suggestive therapeutics, it will cure a large number, but yet the whole number is limited. The trouble with the Osteopaths is that they stop too soon. I am really astonished that men of such evident intelligence and knowledge should so limit themselves in therapeutic agents. As a physician, I think that they should be restrained, for while good as far as they go, they try to apply their methods to diseases where, in the light of present knowledge, it is positively criminal not to use other methods. Diphtheria, for instance, by the use of antitoxine, has lost its terrors. The mortality has been reduced from over 30 per cent to 4 per cent. What earthly good would nerve-tapping do for a tape worm? I think Osteopathy, as understood, should be struck with the jaw bone of an ass.

"Oh, thou invisible spirit of wine; if thou hast no name to be known by, let us call the—Devil." You know by a quotation like this, from Shakespeare, that I have passed to the next subject, viz.: Temperance. Temperance, as known to the physician, is temperance in its large sense, viz.: temperance in all things; as the Bible says, "Be ye temperate in all things;" temperate in all lines of human endeavor, or pleasure, or gratification of the instincts, or the higher craving of the intellect. Temperance of today, however, has practically resolved itself into prohibition of the liquor traffic, the product of the endeavor of the Woman's Christian Temperance Union. For years, this daughter of Francis Willard has been a factor to be reckoned with in every campaign. Quiet, yet

determined, undismayed by reverses, this organization, outside of the ballot, has exercised an influence so potent that three States are wholly prohibition, and many others are honey-combed with local option. A tidal wave seems to have struck this State, and the liquor men are on the run. So you see that this association has a phenomenal record, and, so far as I know, is the only strictly feminine organization that is recognized everywhere by its initials, W. C. T. U. It, like all other organizations, as well as individuals, that have accomplished anything, has concentrated its efforts upon one subject, and that is the prohibition of the liquor traffic. All honor to the women for what they have done and what they propose to do. It is no more to their discredit that some of their members gave moral support to such an intemperate fanatic as Carrie Nation, than that some church people do likewise by wolves in sheep's clothing coming into their midst. Right or wrong, the W. C. T. U., for causes not named, has worked a change in public sentiment, even in our time, as regards the use of spirituous liquors. When I was a boy, it was a familiar thing to hear it said: "That I would rather have Dr. so and so drunk than most doctors sober." "If he would just let liquor alone, he would be the best doctor in town." Now, a doctor that gets drunk has none but his own class to practice upon, and only a few of them. The boozy doctor has about gone. To go a little farther back, one hundred years ago, in France, the physicians of that day advised their patients to avoid water and drink only wine, etc. They were of the opinion that water produced disease, and that liquors containing alcohol were free from such causes. They had doubtless empirically learned that such was the case. A larger knowledge has enabled us to know that water is frequently the bearer of germs that might be removed by boiling or filtration, and that alcohol will destroy these low forms of animal and vegetable life. It is this same larger knowledge that enables physicians of today to know the baneful effects of alcohol upon the system. I do not know that there is any one other subject that has received more thorough study nor is there a scientific subject about which there

is more general knowledge than the effects of alcohol upon the system. This general dissemination of knowledge is due in a great measure to the work of the W. C. T. U. It is taught everywhere in our public schools and by public lectures all over the country. Talented orators are sent out, that are skilled in appealing to the sentiments and feelings of the public, in truly a remarkable way. They picture, in glowing terms, homes wrecked by alcohol as a storm-tossed, angry ocean. It is no pulsing sea, with white-capped waves, and moire lights, but mountains and troughs filled with wrecks. They shift and take another figure and speak of homes made desolate by alcohol, as like a home on a bleak hillside, with no comforts, where sleet and chilling winds blow in; while homes undisturbed by the demon drink are pictured as in a peaceful valley, bountifully supplied from the horn of plenty, into whose open portals blow gentle breezes, ladened with the scent of the pine, the violet and the rose. These, and causes not mentioned, have so changed the public sentiment that where liquors, fifty or a hundred years ago, were on every sideboard, they are now seldom seen. I have now given you briefly some of the objects and accomplishments of the temperance movement. A movement, whether right or wrong, will have its weight in the triumph of truth. I have incidentally referred before to the study of scientists of the effect of alcohol upon the system (when I say alcohol, ethel alcohol is meant). Their investigations, briefly, go to show that long continued use of alcohol in excess causes a hardening of the tissues, especially that of the connective tissue. The connective tissue is not only hardened, but stimulated to increased cell proliferation. This increase of the connective tissue produces destruction of other cell life, by pressure, and consequently the organs affected loose more or less of their functions. Their investigations further show that, in moderate quantities, a mild burning sensation is produced in the mouth and stomach, followed by a period of stimulation both to circulatory, excretory, respiratory, and nervous functions. A feeling of well-being is produced and accompanied by a sedative effect to an over-stimulated, nervous

organism. In non-medicinal or toxic doses, according to the quantity taken, there results a period of more or less stimulation, followed by a period of depression. From investigations of this character has been evolved what is known as Anstie's law. That is to the effect that an average man can take, without detriment to his system, an ounce and one-half of absolute alcohol every twenty-four hours. It is upon this law that life insurance companies ask the question, how much liquor an applicant takes in twenty-four hours. That reminds me of an occurrence, once while making an examination. In reply to the question: "Do you take vinous, spirituous or malt liquors?" (the applicant was a German) he stated: "Yas, I takes beer." Then in reply to the next question, viz.: "How much do you take?" applicant said: "Vat you mean, kags?" Their investigations also show that alcohol, in small quantities, is widely distributed throughout nature, and is more or less in all that we eat and drink. Alcohol also lessens waste and materially lessens the consumption of hydrocarbons, i. e., the fats. In certain cases of nervous dyspepsia it promotes primary assimilation and in this sense is as much a food as water. From the foregoing you can readily see that doctors would be loath to give up a therapeutic agent of so wide a scope of usefulness. Suppose, for instance, you have a wasting disease like consumption, and primary assimilation is bad, is there any agent that would meet the indications like alcohol? Suppose that one is fatigued, after long and violent exercise, so much so that sleep can not be induced. there is nothing that will secure the desired result quicker and more satisfactory than alcohol. Of course, this does not apply to those unfortunate individuals who are tired all the time. The baneful effects of alcohol when used to excess, are enough to deter any reasonable being, but unfortunately all are not so, and consequently some other means are looked for to deter them. We have mentioned some, as the W. C. T. U. and life insurance companies, which have an enlarged knowledge of its ill-effects, but there still remains the most potent of them all, viz.: the commercial world. Men of business have found that sober men are

most needed to carry on successfully their affairs. So the day is fast approaching when a drunken man can only find employment as a back-stop for bullets. If we are to believe the findings of the painstaking investigations of science, then you can readily see we are not tetotalers and have no patience with such as would even banish wine from the communion table. It has been our observation that extremes in this regard are people that have failed in raising their own aright and want to help regulate everybody else's.

There are many reasons why women should be advocates of temperance, i. e., prohibition, and one of them is that a drunken father, husband or son, about the house, is not stylish. He is dirty, filthy, and requires a lot of waiting on and usually can't get anything to do; so somebody has to suffer, and who that is you can readily see. Every woman is proud of her men folks and desires to see them succeed, just the same as every man should be proud of his women and wish to see them a success. Drunkenness in either sex will, of course, blight all hope for any kind of advancement or promotion, for the course of the drunkard is always downward. The doctor of today is not a teetotaler; he, however, condemns drunkenness wherever found, from old Noah down. He thinks in a happy medium the truth, if ever, will be found. Common sense teaches him that any agent, such as alcohol, one so continuously and universally used, can not be wholly bad. The men buy drinks at the saloon, and feel like they own the town. The women buy patent medicines (filled with Sherry wine) at the drug store, and find themselves "new women." The knowing ones hide a smile. The universal craving for alcohol points a moral and that is that an appetite that so nearly approaches an instinct should be controlled and not banished.

CHRISTIAN SCIENCE.

A doctor on Christian Science. Now you expect to see the fur fly, but you are mistaken. I have read a great deal of their literature and know some of them, and can very truthfully say that they are a well-meaning set of people. They are mostly mixed in their

logic, but they are not wholly responsible for that; they are born that way. Did you ever talk to one of them? They are what the boys in my day called "windy and good." They talk about love, affinity, morality, kindness, truth and spirituality, like a phonograph. The same kind of people that, when I was a boy, mother called good, but that always gave me a sudden call to go in swimming. These people have reversed the Darwinian theory and discovered the Motherhood of God. In all humility(?), starting with big I, they trace themselves back to the Motherhood in God, Mrs. Mary Baker Eddy being the "pathfinder." She is a woman that has outlasted three husbands, one of whom she divorced. Her last husband is said to have been a doctor, that adopted her peculiar views, whether from prudential reasons or not, I am unable to state. In 1866, she first took up her healing notions, and, doubtless through mental occupation, got over the hysterics. In 1875, she wrote a book, "Science and Health, with a Key to the Scriptures." It did not take very well at first. But a few that read some of it thought that it sounded good and, since they did not understand its logic, thought it must be scientific, a la Browning. In a little while they commenced to have Christian Science classes. And then in 1892 the First Church Scientist of Boston was built. This is the Mother Church of the cult, and the one all of the leaders have to be a member of and contribute their dollar to. They have there the Metaphysical School of Scientist, of which Mrs. Eddy is emeritus professor or teacher. She owns her book, i. e., "the Key"—to the pocketbooks of the faithful—yet has surrendered everything else to the general cult, truly showing her right to leadership; for all the faithful become book agents of her's, without commission. I said she is a woman, and can prove it. No one knows her age. She is seen but little; is called mother, and said to be sent of God. Her teachings are held all but divine, and she is all but worshiped by her followers. In the language of the East, "Allah is Allah, and Mohamet is his prophet." All jesting aside, I had a serious talk with one of their leaders, a few days ago, and he told me that Christian Science people believed that a

man could have such a thing as a boil and that it would hurt him if he had not gotten sufficiently in harmony with God. He said that such things were the outward manifestations of the material man, and that as the real man (that is, the mind) becomes more like God the subject of these diseases would cease to have them. He stated further that the body was subject to the mind, and if it, the mind, so willed, it could throw off disease. Mechanical or medical means were, in his opinion, wholly unnecessary to relieve pain, since it did not exist save in the mind. I asked him if hunger was a manifestation of the mind. He stated that it was. Why, then, I asked, do you use mechanical means of gratifying it? He replied that Christian Science had done a great work; it had benefited so many; helped the fatherless and widows, etc. And I said, ah! ha! This "sleep walker" told me that his wife worked all day and half the night giving treatment, both present and absent, and still kept well and robust. These treatments are paid for, you understand, at so much a prayer. The price varies, I believe, according to the ability to pay. The peculiar part about these prayers is that they are unuttered and unutterable. Now just conceive of any sane being paying for something that he can not recognize by any of his five senses. This ought to make P. T. Barnum green with envy. These people lay great stress upon the scriptures and claim to follow them literally. The Bible, they claim, holds that disease is cured by prayer, and that all the first Christians were healers. Let us consider that matter for a moment. The Bible is pretty hard upon physicians. You know it says "Asa put his trust in the physicians, and Asa slept with his fathers." Diseases in those days were looked upon as evil spirits inhabiting men, and were dispelled through the good offices of the priests. The quacks of the day were sorcerers and entered into competition with the priests in their healing functions. You will recall that a certain sorcerer came to Peter, the apostle, and offered to buy his secrets; for while he could do some of the things that Peter did he could not do them all. When Christ came down from the Mount of Transfiguration, he cured a case of epilepsy

that His disciples had failed upon. He stated that such came forth only by fasting and prayer. That case, so far as I know, still stands as the only case of organic epilepsy ever cured. The physician as known today was unknown at that time. The services of such as they had were no better and no worse than mere witch craft. Now, because Christ, who came into the world to free of it sin and incidentally cured disease in a manner intelligible to the people of the day, the Christian Scientists want to discard all the vast amount of knowledge acquired since then and return to the practices of two thousand years ago. Christ performed what, in the minds of the people of the day, were termed miracles. He Himself, however, said He came to fulfill the law—of course referring to the Mosaic law; but may we not assume that nature's laws are His laws, and that He utilized them here? He being allwise could utilize these laws in such a manner as to create consternation in the minds of His followers, and perform what to them were miracles. Is it not recorded that He looked on His acts as miracles? As for me, when I read the miracles of Christ, I recognize that I stand in the presence of a divine power that knows all things and can utilize His own laws beyond my thought or comprehension. When you come to think of it, the laws as known are none the less beyond our comprehension; only our familiarity with them makes us disregard their inscrutibleness. I have made this little digression to show that the Bible must not be taken by the Christian Scientist too literally. The Bible, you know, states "that behold, they awoke in the morning and found that they were all dead men." This statement bothers nobody but a fool. Neither should the question of healing give any more difficulty. If the doctors believed about the Bible as the Christian Scientists do, there would be very few of them members of the church, and doctors, as a rule, however, are either members or are esteemed brothers-in-law of the church.

Now, the Christian Scientists do cure and benefit some cases, but not by any new or unheard of way. Time will allow nature to assert itself and give relief to many ills. Suggestion will relieve

many nervous and functional troubles. Mental changes as a new current of thought will allow troubles that we have dwelt upon to disappear through sheer lack of attention. We are all more or less familiar with the influence that mind has over matter. Take for instance a hunter who is so tired that he can scarcely lift one foot after the other and see how quickly all sense of fatigue disappears upon flushing a new covey. Note how a frail and delicate girl, one who can scarcely walk three blocks without fatigue, dances all night wholly unconscious that she has any limbs. Who has not seen the pale lips, blanched cheeks, chattering teeth, the disturbed digestion and fluttering heart of one receiving suddenly bad news? There are cases on record where tumors even have disappeared out of pure dread of their removal. It is needless to multiply instances.

Owing to the legal complications in New York, Mrs. Eddy has advised her followers to cease treating contagious diseases. This seems to be a revised addition to her belief, for, up to this time, disease existed only in the mind, but now an attempt at classification is made. Of course, we can expect such logic in one who denies the evidence of our God-given senses.

A medical opinion of Mrs. Eddy would be that she is an hysterical woman of limited intelligence, with a good heart and kindly intentions, pretty much after Joan of Arc order. These people have often risen in the world and will continue to rise, and will continue to find enough hysterical people like them to keep up the excitement. I do not doubt in the least that they believe what they claim sincerely, but fortunately what we or they believe does not alter the fact. There once lived a negro preacher in my town who believed that the judgment day had arrived, and that he would now rise to heaven. In preparation for such an occasion, he put on white robes and ascended to the roof of the house. At the appointed time, he sprang forward to meet the angels, but his three-story fall, however, made him ascend in a manner wholly unexpected by him. You see the application: beliefs do not alter facts.

Physicians then accord a certain modicum of truth to Dowieites,

Osteopaths, Eddyites and the like, that have arisen and will arise. They use perfectly well-known agents of cure, agents limited, however, in their scope of usefulness and by no means entitled to the exalted place that people of such cults accord them. Physicians contend that they should be restrained for the reason that they either completely ignore or treat in a trifling manner diseases contagious in their nature, that may become a menace to the health and lives of you and me and all others, whether they believe so or not. They further think they should be restrained for the reason that they are a menace to the health and lives of the young and innocent that come under their care, those in whom the State has an interest, a duty and a right to protect.

Now it rests with you, ladies and gentlemen, who are the critics of men and morals, from these views that I have presented and the views of others, to extract the exact truth; the truth that must prevail. I hope you understand that in discussing these subjects, this evening, if they contain misstatements, that such are not made in malice but simply as a presentation of the facts as I see them; for there are good people among all of these cults, that I would not intentionally offend. They have their foibles, just the same as you and I.

At the close of Dr. Red's address, Dr. M. L. Graves, as Orator of the Association, delivered his annual oration as follows:

ANNUAL ORATION.

Like Longfellow's maiden at the brook I come with reluctant feet, and still more reluctant mind, to the time and place where the tiny brook of your social pleasures and association diversions and the great river of your professional toils, care and responsibility meet. I come to pour out my libation, humble, but heartfelt, to the noble profession of which you constitute types and exemplars, and of which I became enamored when the first throbbings of ambition stirred my boyish fancy, and to which I have been happily wedded for more than a decade.

Conscious that "life is a strain of moods like a string of beads, and as we pass through them they prove to be many-colored lenses,

which paint the world their own hue, and each shows only what lies in its focus," still I am mindful that the medical profession carefully studies each bead as it passes, detects every error of refraction in lens or defect of color, and focuses its scientific searchlight upon every avocation, labor or profession of man with the sole inquiring purpose of determining wherein lies the weal or the woe of the race.

Often have I been pained and disappointed to feel that the profession that has always been foremost to spend and be spent in the service of humanity has received no greater civic honor or public recognition. No laurel wreath or glittering crown has ever been awarded to the devoted followers of the Son of Apollo and Coronis. Even history, that serene and sedate record of human events, has signally failed to accord to Hippocrates and his disciples their proper place in human annals.

Poetry, too divine for the contemplation of earthly verities and inspired of that genius next of kin to degeneracy, has failed to fan its muse into a flame upon the ordinary virtues and commonplace attributes of the doctor of medicine. Shakespeare, the greatest of poets, in his master plays, evinces a profound knowledge of medicine and surgery, and even insanity; but his doctors are all weaklings, and too frequently puppets. In Hamlet, Macbeth and King Lear the doctor is in evidence and throughout the play you catch glimpses of the poet's profound knowledge of medicine, but the doctor is not the messenger of his information.

Fiction, also unmindful of its obligation, seems never to have realized the dignity of medicine. Glance at Dickens, Thackeray, Scott, Bulwer, Hugo and the moderns, and nowhere do you find a just appreciation of your arduous labors. At present I can only recall three authors who have the correct conception of your work or worth, or the spirit that animates your scientific efforts. One of these is George Eliot, who, in "Middlemarch," has given us a good portrait of the earnest, active, aggressive, scientific doctor in the person of Frank Lydgate. Next I remember Dr. Weir Mitchell's characterization of Dr. North in a truly scientific spirit, and in Ian MacLaren's "Doctor of the Old School," we have the enduring and beautiful memory of the old family doctor, now fast fading from

the fireside, in his delineation of Dr. Wellum MacLure, perhaps not quite up to date, but with a fund of common sense, and a genuine love of his calling and his race, which inspires the heart of every man who rolls a pill or dispenses a powder.

The stage, that mirror of human activities, is a stranger to the real, true and competent doctor. Never have I seen a play wherein a physician held a character that was not a comedy of errors, or a farce comedy—in which the doctor was the comedy, and his conduct and treatment the farce.

None of our large public parks bear the names of doctors, and nowhere do I recall granite shafts or bronze statues to recall the deeds and memorialize the valor of the guardians of the people's health. Statesmen, soldiers, sailors, poets, scientists, orators, lawyers and ministers are kept alive by public statues. But even our National Hall of Statuary in Washington has nowhere a remembered recognition of the profession of medicine, though even a shoemaker has a place among its immortals. Our national Congress, though often appealed to, has never yet considered the lives and health of the 70,000,000 of people of this republic and their chosen guardians of sufficient importance to occupy a seat in the national counsels, although law and labor, acres and agriculture, pensions and postoffices have their especially appointed protectors.

But if age lends respectability to character, and furnishes forth dignity to calling, then, indeed, the medical profession need not blush for ancestry or tremble for its escutcheon. Long years before modern time had its authenticated record your prototypes were modestly relieving human suffering. Several hundred years before the Great Physician Himself raised Lazarus from the dead, or cured the palsied man, or restored the blinded eyes through Siloam's waters, Hippocrates, the father of medicine, had started our great healing science upon its career of usefulness. Even before theology had formulated its creeds, medicine was ordained of heaven, and the doctor "had been appointed by Almighty God to stand for a fact" and that stupendous fact was humble and sincere service to humanity.

Then, why should we [illegible]petuate fame by the gaudy tinsel

of granite monuments or brazen tablets? Tonight I ask your attention as I portray to you "The Doctor—His Ideals, His Aims and His Rewards."

And what is the doctor? Shall we agree with the Frenchman whose ready wit characterized him as a "man who pours medicine of which he knows little into bodies of which he knows less?" or shall we agree with the Christian Scientist, that "he is simply an error of mortal mind"—indeed, the most colossal error that has ever crossed the threshhold of human experience? Or shall we rather conclude, as Emerson did of the gentleman, that "he is a man of truth, lord of his own actions and expressing that lordship in his behavior, not in any manner dependent and servile either upon persons or opinions or possessions. Beyond this, manhood first, and then gentleness."

The doctor understands full well—

"There is no great and no small,
To the soul that maketh all."

What are his ideals? Recognizing ideal not merely as existing in idea, but as embodying a just conception of general excellence and a standard or model of perfection, let me submit that the true doctor, and I speak for none other, stands:

First. For *Truth*. Truth in the abstract and in the concrete. Truth in theory and in practice. In other words, the conformity of theory with fact. He stands for the eternal verities of human nature against all the abstractions of philosophy and the alluring mysteries of occultism. He believes that honesty is the correct principle, hence he does not advertise. He apprehends that fidelity is a cardinal virtue, therefore he does not falter where duty calls. He realizes that constancy is a constituent factor of truth, and hence he is faithful to every trust. He understands that a glance of the eye, a shrug of the shoulders, an approving nod, to well-directed criticism may act and mean and fasten a falsehood, hence he spurns the black arts of deception and slander. He knows full well the professional spirit abhors a lie, as nature does a vacuum,

and hence no flaming poster or double-leaded columns in the daily press announce his wonderful discoveries and his marvelous cures.

Second. He stands for *Charity*. Charity in its broadest signification; true benevolence and genuine beneficence; earnest well wishing and active well doing. It is not merely in service, but in dollars and cents, and if we believe with one of our greatest writers that the only real gift is "a portion of thyself," I am sure the doctor has laid his highest offering upon the altar of sweet charity. With open hand and heart, he ministers to the afflicted. With sympathy active and alert, day by day and night after night, his ministrations are commanded by the indigent, and I suspect there are physicians in this audience who have given to the poor $100,000 worth of time and attention, with no hope of pecuniary reward. In public calamities, in widespread epidemics, upon boards of health and similar duties, he gives his time and himself, like the gospel of Jesus, "freely, without money and without price." But what is to be said of that broader charity that "vaunteth not itself unseemly" and refuseth to make merchandise of medical science and the preservation of human life?

Whenever Edison invents an electric lamp he secures a national patent, and enriches himself. Whenever Marconi perfects wireless telegraphy he organizes a gigantic company and sells its service, but not its secret. But what of the true doctor? Does commercialism ever crush his scientific spirit or lessen the stream of charity, as it flows from his busy life?

When old Crawford Long, of Georgia, and Wells and Morton, of Massachusetts, discovered the anesthetic effects of chloroform and ether, did they rush to Washington and secure a patent to sell relief to suffering humanity? Did they seek to commercialize for mere money the relief of agonizing maternity as it gronaed in travail under the divine curse? Did they believe that "business is business" and "look out for No. 1?" Were proverbs to supersede the Golden Rule and coin into private wealth the pain and anguish of multiplied millions of human beings? No; like the quality of mercy, their generous spirit was not strained, and their colossal gift to

humanity dropped like the gentle rain from heaven—twice blessed —upon those that gave and upon those that received.

Did William Jenner, stumbling upon the enormous fact of vaccination as a preventive of that dreadful scourge of smallpox, organize a company and wring tribute from dying humanity? Nay, verily. He opened wide the doors of knowledge and gave to the civilized world his wonderful discovery.

Did Sir Joseph Lister hoard the secret of asepsis and antisepsis in the treatment of surgical wounds, and pile up a large fortune in the marts of commerce? No; like the true scientist and charitable physician, his interest in humanity prompted him to give his important discovery to the world, to be used everywhere for suffering men and women.

Did Robert Koch, Germany's grand old doctor, when he discovered, in an obscure village of Germany, the cause of tuberculosis—the great white plague, which decimates one-sixth of the earth's population—did he syndicate science and serve it to the public for money? No; with earnest desire to benefit his fellows he published his discovery throughout the civilized world that all—rich and poor, great and small—might have the benefit.

Did Major Reed, of the United States Army—who martyred his young life to science in Cuba to stamp out yellow fever—did he seek to commercialize his great discovery and enrich himself? No; he hastened to announce the information gained to the medical profession throughout the world. But why multiply examples? The world is familiar, but strangely unmoved, by these heroic deeds. What signify marble columns and glittering brass beside deeds like these? What gigantic bank account or commercial organization can compare in its blessings to humanity? Let millionaires multiply till they are thick as autumn leaves in Vallambrosa; let selfishness and greed and predatory wealth organize every industry into a trust, and let every common necessity of human life fall within the conscienceless grasp of monopoly; but never, so long as this old world goes ringing through limitless space, shall medicine the science, medicine the profession, and medicine the hand-maiden of humanity, attempt to make merchandise of human affliction or

wring commercial tribute from its achievements in the relief of pain and disease.

Third. The true doctor stands for *Patriotism*. Devotion to country in war, in peace, in prosperity and in adversity. In all the glorious annals of our country's military history he occupies a conspicuous and important place. Never does the tocsin of war sound and the trumpet call to the field of sacrifice and suffering that the doctor does not respond. Amid its most sanguinary conflicts, with hurtling death upon every side, he stands like a granite mountain, a restoring refuge for the wounded. The true and loyal doctor takes no delight in human carnage. He does not endorse the oppression of the weak by the strong and lends no ready acceptance to the doctrine that "might makes right." With the last drop of his unselfish blood he would defend his native land against hostile invasion, or sacrifice himself in the protection of her laws and the preservation of her institutions, but no "criminal aggression" can enlist his sympathies or command his services. The annihilation of governments and the spilling of innocent blood as a libation to the military passion of Mars, or the graceless greed of Shylock, can never win his support. He believes in his country's honor and follows her flag with heroic devotion and hopes to extend the blessings of her constitution and of liberty to every man who seeks her protection or enlists in the cause of freedom.

Fourth. He stands for *Science*, and believes with Alexander Pope that the proper doctrine is—

"Know thyself, presume not God to scan,
The proper study of mankind is man."

For the benefit of the visiting ladies present, I beg to add that the last line has been amended by an appreciative wit to read:

"The proper study of mankind is woman."

And I do not doubt every gallant physician present renders ready allegiance to this amendment. The word "science" is derived from Latin—scio, to know, and literally means, in medical science, the perfect comprehension of every fact and function of the human body

and mind, of every environment, drug, medicine or influence that may affect it in health or disease. He must know the intricate details of anatomy, the interesting facts of physiolgy and the necessary details of pathology. Me must understand human nature in the individual and in society. He must learn the laws of heredity and the nature of affinity and consanguinity, and by wise counsel wherever possible, save the State from the perpetuation of the delinquent, dependent and defective aggressors of society by inheritance. He must understand the fundamental and profound facts of sex, and the marriage relation, and be prepared with wisdom and courage to prevent crimes against the race and society by the ignorant and the willful. He must not only look after all the afflictions of the human body which God ordained in dignity and glory, but which some of his ministers continually degrade and debase; but it becomes one of his highest duties to understand and minister to "a mind diseased, pluck from the memory a rooted sorrow, raze out the written troubles of the brain, and with some sweet oblivious antidote cleanse the stuffed bosom of that perilous grief which weighs upon the heart."

Essential to the proper conception of the human laboratory, he must study the chemistry of foods and the metabolism of digestion. Botany, mineralogy, and all their cognate studies must tax his mental energies till every shrub and root and plant and mineral shall yield its therapeutic values to his armamentarium. Much has already been accomplished and the terra incognita of human nature every year opens a new sesame to some curative agency. Year by year another Harvey appears upon the horizon, and supplies the world with accurate knowledge of the circulation of the human blood and all its train of wonderful facts. Every decade some Behring with patient industry and generous spirit announces another antitoxin to rob death of its terrors and spare millions of baby prattlers to brighten and bless our homes.

Moral science stops not at some alluring theory, but with scalpel and forceps, microscope and slide, chemical laboratory and reagent, he dissects, investigates and experiments, till truth, curative truth,

is crystallized from the solution of theory, and science shouts "Eureka!" upon the walls of some citadel of disease.

Wih no narrow partisanship, but with liberal spirit, he welcomes into the field of human usefulness every allied science, and joins with the rest of human kind in paying sincere tribute to the Pasteurs who save the swine from cholera, the grapes from parasites, and find a way to prevent hydrophobia, and renders ready allegiance to the Roentgens, who arrange prisms, touch the electric current and control light, till the inmost recesses of the human body must give up their secrets.

Always and forever the doctor remains a sympathetic subject and loyal devoteee to that splendid science which Canon Farrar in his address to Liverpool College characterized in the following language:

"In this great commercial city, where you are surrounded by the triumphs of science and of mechanism, whose river is plowed by the great steamships, whose white wakes have been called the fittest avenue to the palace front of a mercantile people, you know well that in the achievements of science there is not only beauty and wonder, but also beneficence and power. It is not only that she has revealed to us infinite space crowded with unnumbered worlds; infinite time peopled by unnumbered existences; infinite organisms hitherto invisible, but full of delicate and iridescent loveliness; but also that she has been a great archangel of mercy, devoting herself to the service of man. She has labored, her votaries have labored, not to increase the power of despots, or add to the magnificence of courts, but to extend human happiness, to economize human effort, to extinguish human pain. Where of old men toiled, half-blinded and half-naked, in the mouth of the glowing furnace to mix the white-hot iron, she now substitutes the mechanical action of the viewless air. She has enlisted the sunbeam in her service to limn for us, with absolute fidelity, the faces of the friends we love. She has shown the poor miner how he may work in safety, even amid the explosive fire-damp of the mine. She has by her anesthetics enabled the sufferer to be hushed and unconscious while the delicate hand of some skilled operator cuts a fragment from the nervous circle of the

unquivering eye. She points not to pyramids built during weary centuries by the sweat of miserable nations, but to the lighthouse and the steamship, to the railroad and the telegraph. She has restored eyes to the blind and hearing to the deaf. She has lengthened life, she has minimized danger, she has controlled madness, she has trampled on disease. And, on all these grounds, I think that none of our sons should grow up wholly ignorant of studies which at once train the reason and fire the imagination, which fashion as well as forge, which can feed as well as fill the mind."

Fifth. He stands for the *Home and the Family.* The unit of human society, the open and inviting door of our national hope and the supreme center and core of our expanding Christianity. Every home in our broad land has a true and loyal friend in the physician. He worships at the altar where the pristine purity of loving motherhood and the inspiring example of noble fatherhood erect their fanes and rear their sons and daughters "far from the madding crowd's ignoble strife." He stands upon the housetop and raises his warning cry at every social sin that would lay its black touch upon the virtuous homes of our country. He scorns with indignant disgust the civilization that sees no expanding glory to our country in homes filled full of romping boyhood and happy girlhood. He exercises his utmost endeavor to free society from the crime of child murder, whether in forge or factory, sweating out little lives in the mad struggle for wealth or existence, or in crowded or filthy tenements, to become a ready prey to pestilence and epidemic. He remembers that the noblest man who ever lived said of these little ones, "Whosoever offendeth one of these little ones, it were better for him that a millstone be hanged about his neck and he were cast into the sea."

The genuine doctor stands for the purity of womanhood, the nobility of manhood and the preservation of childhood. He is the first with cheery sympathy to welcome baby into the world, and with unconcealed joy watches faithfully and fondly his developing manhood and budding womanhood, and with untiring devotion seeks by every aid of medical science, education, knowledge and truth to bring him up as Solomon suggested, so that "when he is old he will

not depart from" the paths of honor, sobriety, temperance, integrity, virtue and usefulness.

The honorable physician could not be induced by any manner or means to prevent his honorable entrance into the world, or condone his neglect or mistreatment afterwards. He believes a just conception of and protection by society of the home and family are the surest guarantees of our liberties as a people and our survival as a nation. And whenever one of our number so far forgets his honor and debases his profession as to sacrifice innocent childhood to social respectability, he is driven from among us and becomes an outcast forever.

Sixth. He stands for *Duty*. The immortal Lee's sublimest word in the English language. Subject like other men to disease, suffering and death, who ever heard of a doctor deserting his post when danger threatened or death lurked in every passing breeze? When war comes with its blighting carnage he volunteers his service, stands faithfully in the midst of shot and shell, suffers privation with his fellows, and retreats *never*. When epidemic spreads his black wings over a fertile land and blows the appalling breath of yellow jack, the black plague, cholera, typhus, smallpox and a host of lesser terrors into the homes of the people, he gives every atom of human energy and every inspiration of mortal mind to the prevention of death and the relief of distress. When brutalities untold were practiced in every nation of the globe upon the most unfortunate of God's creatures—the helpless and hopeless insane—he stepped bravely to the side of the sufferers, struck the shackles from their limbs, the terrors from their minds, and restored them to reason and to liberty, amidst public protest and official denunciation.

With this imperfect review of some of the doctor's ideals, permit me to ask, what are his aims?

Browning says: "The aim, if reached, makes great the life;" and I am disposed to agree with this assertion in speaking of my profession. He who thinks the doctor's aims and purposes are confined to the narrow channel of pills and potions, malaria and rheumatism, but little comprehends the true nature of medicine as a

profession, and the doctor as a servitor of human kind. Let me briefly enumerate some of his aims.

First. He stands for the *conservation* of public hygiene and sanitation. In season and out of season his voice is heard in public assemblies, in halls of legislation and in private conversation, urging the strictest observance of the laws of personal and public hygiene. Nearly every municipal ordinance looking to the sanitation of our public schools or theaters, the proper ventilation of public buildings, the correct disposal of sewage and such allied matters have their inspiration in the doctor's busy mind. The cleanliness of your streets, the disposal of storm water, the beautification of those breathing spots of the city—the public parks—have your constant attention and aggressive support.

Second. The *preservation* of the public and private health. Almost every law for the protection of public health is primarily inspired by the medical man. Alert, studious, thoughtful, he finds the cause of contagion and infection, and recommends measures to prevent and control them. Much of his time is given to the free education of the public in the laws of health. He investigates plumbing and demands the scientific qualification of those entrusted with the work. He analyzes the water supply, and discovers the source of typhoid fever, dysentery and a host of kindred troubles. He intercepts the milk cart, and discovers adulterations, dirt, and chemical preservatives and issues a warning note to the public. He looks after the slaughtering of cattle and hogs, and the exposure of embalmed and unsafe articles of food for sale, and secures municipal, State and national legislation, to promote the sale of pure foods and prohibit the sale of adulterated articles. He studies the quality of climate and the nature of the air we breathe and stands ready to ward off danger and recommend relief. He looks into our railroad coaches and finds multiplied millions of noxious germs and bacilli and secures their proper disinfection and cleanliness. He is foremost in the organization of the hospital and the eleemosynary institution to care for the indigent sick and insane, and thus insure the individual proper treatment and the protection and safety of society. He advocates the isolation of the consumptive and other deadly

contagions, and the scientific destruction of their death-breeding germs and toxins.

He seeks the proper and legal regulation of the social evil and careful inspection under official authority to prevent the widespread distribution of loathsome, life-burdening, body-destroying and mind-wrecking disease, which fill our almshouses, jails, hospitals and asylums with the distorted wrecks of manhood and womanhood.

Antipodal thought seems to engage the attention of the pulpit and the medical profession. The one earnestly and always preaches *regenerate,* while the other, with sickening heart, sees the swelling tide of *degenerate,* born to undo the work of the other. Evolution is perhaps the crowning glory of the nineteenth century; let us beware, lest reversion become the bitter fruit of the twentieth.

Third. The progressive physician stands for the *development* of *racial* and *individual character.* He wants no maudlin sentimentality about this country being the asylum for the oppressed of other lands to attract to our social current strains of degenerate blood and neurotic heredity, to engraft their mental, moral, physical and spiritual weaknesses upon our own people. He protests against this nation becoming the dumping ground of the yellow perils of Asia, or the impoverished constitutions and polluted bloods of Europe. He welcomes to this "land of the free and home of the brave" the hearty, vigorous, honest, God-fearing and God-serving people of other countries, who seek our fertile lands for a better existence and the protection of our laws, and the benefits of our institutions. But —when they come—he wants them to become American citizens, and, while not forgetting "their own, their native land," to become imbued with American ideals, inspired by American history, devoted to American principles of government, and an integral part of American civilization.

He glories in race pride, and wants America to develop the *race* and the people, combining the physical endurance and courage of the Spartan, the lofty patriotism and national glory of the Roman, the splendid culture and artistic beauty of the Greek, the unwavering tenacity and stubborn purpose of the Anglo-Saxon, the solida-

rity and strength of the Teuton, and the rugged character and aggressiveness of the Slav.

Fourth. The doctor stands for the protection of *public morals* and *private character*. Occupying the most confidential relation known to man, knowing the skeleton in every closet, impressed with the responsibility of his position, and stimulated by an earnest desire to promote the highest morals, he keeps his own counsel, and by wise advice and sympathetic direction lessens immorality and prevents crime.

Acquainted with all secrets, he stands the guardian and defender of the home, and whether by legal statute his knowledge is made *privileged matter*, he betrays no confidence and causes no shame. Unwilling to countenance the violation of law, or be a party to the "slaughter of the innocents," he seeks to impress upon offenders their moral obligation and urges upon them the preservation of social decency and domestic purity.

Sir Gallahad finds in him no protector and defender. Neither does Mary Magdalene encounter him as a bitter persecutor and blatant denunciator. He knows the limitations of human strength, the temptations of earthly flesh, the inequality of social standards and the prating hypocrisy of Pharasaic Puritans, and, while countenancing no wrong and accusing no wrongdoer, he seeks with the mantle of charity to cover some of their faults, and with a feeling of human brotherhood to lift them from the mire of sin and corruption, and place their feet upon the solid foundation of uprightness and honor.

Fifth. The progressive physician believes in the *dissemination of education*, and the distribution of knowledge. His helping hand is found in every college, high school and university. He serves upon boards of trustees, and is frequently foremost in common school and advanced educational movements. He sometimes feels inclined to agree with the eloquent Robert G. Ingersoll, that "ignorance is the greatest crime." Some of our members, fortunate in business, have endowed colleges and equipped seminaries, with every scientific apparatus and facility for research. By making his own profession one of learning and scholarly attainments the doctor has

taught, both by precept and example, the value of higher education. But, while advocating culture and extending the limits of instruction, the medical man does not consider all of our present school methods and college curricula ordained of reason, or executed with sound judgment.

He believes the fundamental purpose of education is to *train* and *discipline* the mind, rather than to acquire information. Education is but a means, not an end. It were better to learn to *think* than to store the memory with all the wealth of classics, metaphysics and science. A fund of information is one thing, and a well-trained mind, capable of assimilating the facts of nature and shaping wise policies therefrom, is quite another. He fears that our children are sent to school too early in life and rushed through iron-clad courses without regard to health or the physiological development of body and mind. He feels that their little minds are burdened with a mass of historical data and classical lore to the exclusion of practical information that fits them for *real living* in a *real world*. He discourages the forcing-house methods of schools and colleges, because he sees the numerous wrecks of youth, pushed beyond the physiological limits of safety and sense. He recognizes neuralgia, chorea, neurasthenia, dyspepsia, eye-strain and a host of neurotic disorders, resultant from the unwise rush of present-day school methods. The common school heritage of Texas, provided by wise and noble men, is ample to meet the needs of our people. Let it be wisely utilized. Let our children *learn and love to learn*. Let not dry facts drive the vivid imagination of childhood from the school room; let teaching be made attractive and learning a pleasure, then will education become, as Shakespeare said of philosophy, "a perpetual feast of nectared sweets."

And now, in conclusion, what are his *rewards?* I see before me aged men, whose busy years of usefulness and devotion to the profession have brought upon them prematurely the arcus senilis of physical decay. I look again, and behold young men, just stepping out upon life's highway with bouyant tread and ambitious, hopeful hearts.

What has been the sustaining recompense of the one through all these fruitful years, and what is to be the guerdon for the promising labors of the other? I shall answer—

First. The *consciousness of duty done, and real service rendered humanity.* When maturing years have sobered ambition and produced reflection of mind on what life has brought, it is a gratifying feeling to know that "To say well is good, but to do well is better." The doing of a good deed is its own reward, and when we look into history and find wrecks of ambition, we may enjoy a happier frame of mind in contemplating the usefulness of a well-spent professional career. I learn from one of Sir John Lubbock's lectures that—

"Anthony sought for happiness in love, Brutus in glory, Cæsar in dominion. The first found disgrace, the second disgust, the last ingratitude—and each destruction." It is said of Cardinal Wolsey, in the closing agony of his life, that he exclaimed:

"Had I served my God with half the zeal I have served my king,
He would not in mine extremity have deserted me."

And so, the busy doctor, unostentatiously going about doing good, can rest content in the "happiness of duty done."

Second. With *competency, economy* and *judgment,* the doctor may look forward to *financial independence,* and when the withering touch of time has palsied his active energies it will not be

"Over the hills to the poor house"

with the faithful physician. I need scarcely add here, that the accumulation of money requires good business judgment to invest it, as well as professional ability to earn it. Commerce knows no sentiment, and business no sympathy. Some one writing to his son upon entering a profession told him

"Keep your office and your office will keep you."

This is particularly true of the busy doctor. While doing much with hope of pecuniary reward, he frequently finds

"His house was known to all the vagrant train,
He chid their wanderings, but relieved their pain."

And cherished by the expectant and receiving community he becomes

"A man to all the country dear,
And passing rich, with forty pounds a year."

When the service is rendered the grateful patient receives his bill, the doctor sits in his office, his mind vaguely wandering over the three degrees of comparison: "Positive ill, comparative pill, superlative bill," while the unsatisfied patients add "diminutive kill."

Business sagacity will suggest to my colleagues their financial remuneration more clearly than any language of mine. True it is, here and there are great souls, wedded to artistic and even scientific ideals, who give no thought to that material wealth which "moth and rust doth corrupt, and which thieves break through and steal," unconscious that the thieves who break through and steal their treasures are the unappreciative persons who tax their utmost energies and then regard not obligation and render not gratitude. Mere parasites upon our profession should be boldly shaken off, while genuine charity will always hear the doctor's cheerful and willing knock at the humble door.

Let those who are young and just starting a professional career be admonished to do everything well, no matter how small and insignificant. Indeed, just a little better than any one else will or can do. Then "strike while the iron is hot" and your bank account and personal reputation will both go up in the market. To all such, medicine presents a sufficient livelihood in active service, and with any sort of business judgment a competency

"When the lamp of your life grows dim from age, and is finally snuffed out by younger men."

Third. The doctor who merits and attains professional success acquires a personal and social standing for himself and family that can not be bought with money. This, of course, is not the ultima thule of his ambitions and endeavors, but it is a good professional

asset, and is a marked reward of the earnest professional life. We live in the atmosphere created by our associations, and with a firm position in educational advancement and in the social esteem of one's fellows, it follows that life's joys are correspondingly increased, and its opportunities for usefulness greatly enhanced. No Robinson Crusoe isolation makes for the strongest and best character development or affords a privilege for the highest service to the race. Man is gregarious, and the professional man is no exception to the rule. The stronger his position in the human flock, the broader his sphere of social and personal usefulness, the greater will be his success in medicine.

Fourth. His own *cultural development and character building.*

It has been previously shown that medical men are progressive, aggressive, devoted to science, education, and the nobler virtues. It follows as a necessary corollary that a distinct hue of character is given by constant association with noble thoughts and lofty ideals.

Socrates taught that "contemplation of the virtues of life makes one noble and virtuous," and this identical philosophy is distinctly taught in the Bible, when we are enjoined that

"Whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, and whatsoever things are of good report, think on these things."

When you meditate upon the scenes of a busy doctor's life, how his aspirations are stirred, his sentiments quickened, his sympathies enlisted, and his whole heart aroused by appeals from the suffering and their grateful recognition, it is readily understood that the growth of his own character is perfected through his very avocation in life.

Prof. Henry Drummond, in an admirable address on the "Greatest Thing in Life," has described in character building what he calls the "spectrum of love," and like the solar spectrum, it has a number of elements, which he asserts to be "patience, kindness, generosity, humility, courtesy, unselfishness, good temper, guilelessness and sincerity," and he claims that "these make up the supreme gift—the stature of the perfect man."

How beautiful the thought, and how beautifully adapted to the

busy life of the charitable, generous, courteous, sincere and honest practitioner of the "healing art." Therefore we can agree with Tennyson that "self-reverence, self-knowledge, self-control, these three alone lead life to sovereign power."

Fifth. And finally, *a safe and secure position in public esteem and private affection, a monument of love in the homes and hearts of the people.*

Henry Clay, in his hour of greatest political and personal disappointment, gave utterance to a noble thought when he exclaimed

"I had rather be right than President."

And Jesus the Nazarene in his sacrificial life uttered a still nobler philosophy when it was said of him

"He went about doing good."

This is approximately true of the genuine medical man, whose mission of mercy and helpfulness ends only in the silence of the tomb.

Victor Hugo, in the greatest of all historical fiction, "Les Miserables," gave utterance to the thought that "No man should count his life either fortunate or happy until its closing hour," when calm contemplation could review its acts, adjudge it without selfishness, and the future offered no opportunity to mar the beauty and symmetry of the picture.

In consideration of human frailty, and the historical illustrations of ultimate darkness after a brilliant looming on life's early horizon, this may be a just and proper admonition, but permit me to add a serener philosophy—like nature knows no ultimate destruction of primal matter, and we all agree with the poet who taught us to

"Count that day lost whose low descending sun
Views from thy hands no worthy action done."

And we can rest supremely content if only the "cup of cold water" has been given to some afflicted fellow, or, like Prospero:

"Mine eyes, even sociable to the shew of thine—
Fall fellowly drops."

While in rare instances unappreciative patients treat the doctors as Stephano proposed to treat the sprites—

"Flout 'em and scout 'em, and scout 'em and flout 'em."

Still, it must be frankly admitted that, for the most part, a grateful public cherishes the warmest admiration for the faithful physician.

And now, my friends, our ideal doctor's busy life is o'er. His ideals ended, his aims accomplished, his rewards enjoyed. His last call is made; his last soothing word is spoken to some heart-stricken mother, as her fresh falling tears sanctify a new-made grave. His last medical ministration has stayed the ravages of disease and kindled hope—eternal hope—in some sorrowing father's heart. His last surgical operation has restored a husband's useful life to an almost widowed home. His last cheery smile has brightened suffering childhood's wan and weary face. His last cordial handshake has spurred young manhood into nobler purposes and inspired despairing girlhood into loftier life. And—what of him?

Sir Christopher Wren, the great English architect, who designed St. Paul's Cathedral, the Royal Naval Hospital, and the Towers of Westminster Abbey, is said to have ordered inscribed on his tomb the following Latin sentence:

"Si monumentum quaeris, circumspice," which means "If you seek a monument, look around you."

And so, my splendid colleagues, you need no brazen tablets, no granite spires and marble shafts to perpetuate your well-cherished memory and memorialize your deeds of kindness, and when

"Life's duty done, life's race run, life's crown won,"

With clear conscience you may

"Wrap the drapery of your couch about you, and
Lie down to pleasant dreams."

And if you seek a monument, only look around you and witness the enduring memory of your labors, in the homes and hearts of your people.

FOURTH DAY.—*Morning Session.*

President Red called the Association to order at 8:30 a. m., making the hour somewhat earlier than the program called for, on account of the volume of business to be transacted.

First matter was the report of the Nominating Committee, which was presented by Dr. J. R. Nichols, as Secretary of the committee.

The report was as follows:

To the President and Members of the State Medical Association of Texas:

We, your Nominating Committee, in reporting, beg leave to make the following recommendations:

For President—Dr. Frank Paschal, San Antonio, and Dr. S. T. Turner, El Paso.

For First Vice-President—Dr. F. E. Daniel, Austin.

For Second Vice-President—Dr. A. L. Hathcock, Palestine.

For Third Vice-President—Dr. Joe Becton, Greenville.

The Five Trustees—Dr. F. D. Thompson, Fort Worth; Dr. J. D. Osborn, Cleburne; Dr. Walter Shropshire, Yoakum; Dr. J. B. Shelmire, Dallas; Dr. B. F. Kingsley, San Antonio.

For Orator—Dr. H. A. Barr, Beaumont.

For Members of State Board of Examiners:

First District—Dr. D. J. Jenkins, Daingerfield.
Second District—Dr. E. E. Guinn, Jacksonville.
Third District—Dr. T. J. Bell, Tyler.
Fourth District—Dr. J. T. Wilson, Sherman.
Fifth District—Dr. J. C. Loggins, Ennis.
Sixth District—Dr. J. M. Nicks, Stone City.
Seventh District—Dr. J. H. Evans, Palestine.
Eighth District—Dr. S. R. Burroughs, Buffalo.
Ninth District—Dr. J. H. Reuss, Cuero.
Tenth District—Dr. M. M. Smith, Austin.
Eleventh District—Dr. J. M. Frazier, Belton.
Twelfth District—Dr. J. D. Osborn, Cleburne.

Thirteenth District—Dr. W. H. Pennington, Justin.
Fourteenth District—Dr. T. T. Jackson, San Antonio.
Fifteenth District—Dr. H. J. Hamilton, Laredo.
Sixteenth District—Dr. S. T. Turner, El Paso.

From State at large—Dr. J. W. Scott, Houston, and Dr. J. C. Jones, Gonzales.

Place of meeting—Austin.

Chairman Committee of Arrangements—Dr. T. J. Bennett, Austin.

T. J. BENNETT, Chairman,
J. R. NICHOLS, Secretary.

The report of the Nominating Committee was adopted and the Association proceeded to the election of President. The names of Drs. Paschal and Turner were submitted. Dr. Turner spoke as follows:

The members of this Association do not owe me anything, I have already been abundantly rewarded for all services rendered, while the other gentleman, who has been honored with myself, his locks have grown thin in the service of the profession of Texas, and he deserves all the honor this Association can bestow upon him, and I now beg to withdraw my name and move that Dr. Paschal be elected President by acclamation.

Dr. Frank Paschal was accordingly elected President by acclamation, and Drs. Shropshire and Cantrell were selected to escort the President to the chair.

DR. SHROPSHIRE: Your committee to whom was given the honor to escort the President to his chair have done their duty, and we have now before you Dr. Frank Paschal, our next President.

DR. S. C. RED: The Chair thanks you for the uniform courtesy and kindness that has marked this meeting of the Association, and now, with great pleasure and satisfaction, turns the gavel over to Dr. Frank Paschal, your newly-elected President.

Dr. Frank Paschal, on accepting the chair as President, spoke as follows:

Gentlemen of the Texas State Medical Association:

I appreciate the honor that you have conferred upon me, and can hardly find words in which to thank you for so distinguished an honor. I realize that you have given to me the greatest gift within your keeping, and that,

too, at a time when your Association requires great care to keep it from going against shoals on the adopted plan of reorganization. I also realize the fact that every effort must be made to harmonize the profession; that we must do this by prudence, by toleration, by care, by having it known that the efforts we are making are for the good of the profession, and that no one man or set of men are being favored in the reorganization of our Association. It is intended in the plan of reorganization to cement the profession so as to make it a unit, it being the idea that we will all be benefited by those measures upon which we unite, and the people will give to the profession the recognition to which we are justly entitled. We must so conduct the affairs of the Association that no man can say that this plan of reorganization was for the purpose of benefiting one man more than another, and as President of your body, I will not advocate measures that will have for their purpose the perpetuation of power or of furthering the interests of one man or one set of men.

In regard to one man holding two offices in this Association, I believe that there should be a clause inserted in our Constitution to forbid it, and it should be just as much against the Constitution of the State Medical Association for one man to hold two offices in the Association as it is against the Constitution of the State of Texas.

There are many things that will come up before us, also many measures which will require your attention. One that I will call your attention to right now is the State Board of Medical Examiners. The law requires the selection every two years of a new Board of Medical Examiners. I think the law should be amended so that four men could be appointed to serve for two years and five men for four years. As the law is now enacted, new men are liable to be appointed every two years, who will find their duties very hard, as everything will be new to them unless they happen to have some of the old members to constitute part of the Board. There will always be matters coming up which must be carefully considered, and unless there are some of the old members of the Board to guide them, they are liable to make many mistakes.

Another thing about the Board is this, and I simply throw it out as a hint, and ask that the members of the Examining Board consider it as such: The amount of work that devolves upon the Board is enormous. To give you an idea, we had before the Examining Board last week ninety-seven applicants; there are ten questions on each branch, and there are thirteen branches examined on, or 970 answers on each subject to be graded, and in addition, some of the members of the Board have two subjects which they examine on. At the examination just mentioned, that was held in Austin, one of the applicants was a Mexican, and answered his questions in Spanish. It fell to my lot to have to translate and grade

his papers, making over two thousand answers to questions that I had to grade. Some of the answers to a single question sometimes covers three and four pages of foolscap paper. I began grading my papers Monday afternoon, and worked almost incessantly, night and day, until 4 a. m. Thursday morning before I had finished. Now I know from experience that 2000 answers can not be gone over and finished in two or three days, without extraordinary hard work.

I am free to acknowledge that where one grades on one subject alone, the answers might be graded in two or three days, but I do not think the Board should be in a hurry; the questions should be taken home, and the answers carefully studied and graded, and the Board should not hasten in order that the applicants may know before they leave, where the examination was held, whether they have passed or failed.

I must ask that the members of this Association begin to study from today measures for the creation of a State Board of Health; your recommendations on that subject should be so well defined as to make it absolutely unmistakable. For the next two years we are safe, because we have in Dr. George Tabor, Health Officer, a man in whom we have absolute confidence. I hope this body will give the matter careful consideration, and that a committee may be appointed to draft a bill as mapped out by this Association.

Mr. President, I accept the gavel from you, as a symbol of authority, and I hope that I may be able to wield it with the same impartiality that you have done, and in handing it to my successor, that it may go to him unsullied, and that it may never be said that it was even used arbitrarily, and may it be handed thus—from generation to generation to time immemorial.

Dr. J. C. Loggins and Dr. T. J. Bell were selected to escort Dr. F. E. Daniel, the Vice-President, to the chair.

Dr. Daniel said:

GENTLEMEN: Permit me, as best I can in a few simple and brief words, to express to you my grateful acknowledgments of the courtesy and consideration shown, by conferring upon me so distinguished an honor. I take it as a mark of your appreciation of my humble efforts during a quarter of a century in behalf of legitimate medicine, a better, purer and more exalted standard of professional character, and my labors in behalf of the public health. I thank you.

The Judicial Council, through Secretary M. M. Smith, recommended the name of Major Chas. F. Mason, U. S. A., Fort Sam

Houston, San Antonio, as honorary member of this Association, in accordance with a resolution introduced before this body yesterday.

Dr. M. M. Smith spoke as follows in regard to printing of the new Constitution and By-Laws.

I was in conference with Dr. McCormack, being Secretary of that Provisional House of Delegates, last night, and he assured us that he usually recommended, and that, as a rule, we instructed our Secretary to procure 50,000 copies of these Constitution and By-Laws. He said that he usually came and held a meeting and told them what to do, and what was necessary for them to get.

I am sure that the plan by which we can get them from the *Journal of the American Medical Association* is very cheap; they have them in type, and that the expense will not be very much. I am in favor of allowing the resolution to stand.

Dr. M. M. Smith, of Austin, moved that the Secretary of the State Association be authorized to have 10,000 reprints of the report of the State Board of Medical Examiners published, with a list of names of those who had been licensed sinec the organization of the Board.

Dr. T. J. Bell, of Tyler, approved the suggestion and seconded the motion, whereupon Dr. H. A. West made the following remarks:

DR. H. A. WEST: I do not see that a list of those who have been examined by this Board should constitute a part of our proceedings, hence it is not our business to publish the same. It is as much as we can do to pay our own expenses, as we will have a large volume of Transactions, and will have to pay the expenses of the Councilors in the organization of the State. It will strain our resources to the utmost, and besides that, we have nothing to do in regard to the State Board of Medical Examiners, except to nominate them to the Governor for appointment. This Board is a State institution, and if they want anybody to pay their expenses let them get the State to do it and not attempt to force this matter on the State Medical Association.

DR. S. C. RED: What advantage would it be to have the names of the fifteen hundred printed in the Transactions? They are on the books of the Board of Medical Examiners and a matter of public record.

DR. M. M. SMITH: Their certificates are placed on record on the books of the district clerks of the State, but we get letters every day or so asking

if the Board has licensed such and such an individual; we get applications almost every day to furnish a list up to the present time. Such a report would be of very great assistance to these respective county societies in keeping a watch out for men not on the list and who have not complied with the law. It would also be of very great value in getting rid of incompetent physicians in the State. An alphabetical list of 1600 names would be but very few pages more in the proceedings, and would add materially to same.

DR. J. R. NICHOLS: I understand that the law requires every physician and surgeon to register his certificate in the county in which he expects to practice. It appears to me that the district organizers can ascertain from the records those who have complied with the law; also from the local profession the ethical standing of each applicant. We well know that the professional population of each county varies from time to time and it appears to me that nothing will be gained by printing lists of those who have certificates from our Examining Board in our Transactions, besides by so doing we will not ascertain the ethical standing of the applicant, which, in my judgment, is all-important.

DR. J. T. MOORE: I do not see where the publication of this list of names in the Transactions comes in. I can not see what advantage it would be to this body. It is taken for granted that the Board preserves the names of those who come before it at the central office, and this is in the hands of the Secretary and can be gotten at any time. To have the names of all the persons who have come before the Board and publish the report of the Examining Board to this body would be an important document that we are all concerned in; but as far as the list is concerned, it will always be in the hands of the Secretary and can be gotten at any time. If you desire to publish these names at all, it seems to me that they could be published in a little pamphlet without padding our Transactions with the list.

DR. T. J. BELL: Not that I am offering this as a motion, but it occurs to me that it might be well to have this publication here in some way, because you can not depend upon the records in the office of the district clerk, and I think this would be satisfactory and a safe thing to do, as the Secretary has indicated to this Association, to have this matter embodied in the Transactions; therefore, I think it would be wise to do that.

The motion was lost.

Dr. H. A. West then spoke as follows in regard to honorary membership:

Honorary members, according to the new Constitution, are elected only for one year. We have on our list now quite a number of honorary members. I would like to know whether they shall be included in the next proceedings.

DR. C. W. GODDARD: As we are yet under the rules of the old Constitution, and the new Constitution is not in effect, I move that these honorary members' names be entered in the proceedings.

Dr. Wm. Keiller then offered the following amendment to the motion, which was accepted by Dr. Goddard:

DR. WM. KEILLER: As an amendment, that these honorary members be connected with an asterisk and that their names be not dropped; they might be hurt in some way.

The amendment was accepted.

Dr. H. W. Crouse then directed the attention of the Association to a "fake," who was operating in Victoria. He spoke as follows:

I have written to several members of the Texas Medical Association within the last six weeks in regard to a fake that we have practicing in Victoria, named H. Campbell. We have had this man arrested under eight indictments. By some peculiar process, just exactly the nature of which I am unable to explain, he has been able to keep clear of the law and is permitted to conduct his practice. Under the old law, eight charges were preferred against him, and he was placed under bond, but skipped town during the night, jumping his bond. He returned in several months, and, by paying the costs of one of the cases, was permitted to stay and is now practicing again in Victoria. We had him brought up very recently in court under five indictments, but when the case came to trial, it was thrown out of court. He had a friend, an ex-policeman of Galveston, to swear that he had practiced in Galveston in 1885. I wrote to Dr. M. M. Smith to call his attention to the man, informing him that he was practicing in our county, and asked him if he had passed the Board of Medical Examiners, and requested that this case be put to the test—to make, in other words, a test of our present law, to find whether it is successful or not. In my opinion, at the present time, our medical law is such that it places restrictions upon those who graduate from a legitimate college and fails to hold down the fake. Is it not possible that a concerted effort be made by members of the State in handling such a case and proving whether our law is of benefit or not?

Dr. H. A. West then addressed the Association upon the subject of the meeting of the American Medical Association at New

Orleans, advising all who could possibly do so to attend that meeting and offering to aid in every possible way the registration of those who wished to go.

DR. M. M. SMITH: I want information on a little point. My understanding that members of this Association who have read papers before this meeting, if the author so desires he may publish same where he likes; but under reorganization according to the American Medical Association plan this rule does not work. I want to know, do they go into effect after adjournment of this Association or do the Constitution and By-Laws governing this Association govern the publication of these papers?

DR. H. A. WEST: My understanding is, so far as the publication of the papers is concerned, that we operate under the old by-law, wherein authors if they so desire are allowed to publish their papers elsewhere before their appearance in the proceedings.

DR. S. C. RED: The rules and regulations of the new Constitution should go into effect immediately upon the adjournment of this body, i. e., as soon as we adjourn here the new Constitution and By-Laws will be in force.

DR. J. T. MOORE: I think it would be very unfortunate to attempt to work under the old Constitution, because the work we have done would practically be of no value. In order to settle this matter with reference to publishing papers, I move that all persons who have contributed to this Association be allowed to publish them where they choose, in addition to their publication in the Transactions.

The motion, upon being duly seconded, was adopted.

Dr. Crouse offered the following resolution:

I wish to make a motion that this part of the executive work stop, and that we take up the reading of papers instead.

DR. S. C. RED: I would like to ask if this is the last business session before we close?

Dr. H. A. West offered the following amendment: That we take up scientific work for a little while and that executive business be resumed after reading of papers.

The motion, as amended, was then adopted.

Obstetrics and Diseases of Children was the first Section which had papers unread.

Dr. T. J. Bell, of Tyler, was called to the chair, and he proceeded

to read his paper, entitled "When is Prevention of Conception Justifiable?" which was freely and extensively discussed by the following: Drs. Wm. Keiller, Frank Paschal, Chas. Wardell Stiles, M. H. S., John T. Moore, J. C. Loggins, Dr. H. A. West, G. H. Moody, J. F. Y. Paine; and closed by Dr. T. J. Bell.

The following papers were read by title: "Otitis Media From the Standpoint of the General Practitioner," by Dr. E. E. Guinn. "Cow's Milk; Its Care and Use in Infant Feeding," by Dr. Jas. H. Bute.

The Section on Surgery was then taken up, and Dr. Wm. Keiller took the chair.

"A Case of Abdominal Suppuration of Obscure Origin," was the title of a paper read by Dr. A. L. Hathcock, of Palestine.

Dr. Hathcock's paper was discussed by Dr. H. W. Crouse, of Victoria.

On motion of Dr. H. A. West, all unread papers were referred to the Publishing Committee.

The Section on State Medicine was then called, and Dr. Frank Paschal was called to the chair.

"The Tuberculin Test in the Diagnosis of Tuberculosis in Man," was the title of a paper read by Dr. Boyd Cornick, of San Angelo, which was then discussed by Dr. H. W. Crouse, of Victoria.

The following papers were referred to the Publishing Committee after being read by title:

"The Climatology of Fort Davis," by Dr. W. T. Davis, of Fort Davis; "The Public Control of Tuberculosis," by Dr. W. S. Carter; "The Adaptability of the Climate of Western Texas for the Treatment of Pulmonary Tuberculosis," by Dr. C. H. Wilkinson, of Galveston.

Dr. H. A. West then offered the following resolution:

Resolved, That we hereby extend our hearty thanks to the physicians, the citizens, and especially to the ladies of San Antonio, for their magnificent hospitality, to the public press and to all others who have so kindly and freely contributed to make this one of the most pleasant meetings ever held in the history of the Association.

Unanimously adopted.

Upon motion, the Association adjourned to meet at Austin the fourth Tuesday in April, 1904.

Minutes approved.

FRANK PASCHAL, President.

H. A. WEST, Secretary.

PAPERS READ

BEFORE THE

THIRTY-FIFTH ANNUAL MEETING

OF THE

STATE MEDICAL ASSOCIATION OF TEXAS,

HELD AT

SAN ANTONIO, TEXAS,

APRIL 28TH, 29TH, 30TH, AND MAY 1ST, 1903.

SECTION ON GENERAL MEDICINE.

CHAIRMAN'S ADDRESS.

JOHN T. MOORE, M. D.,

GALVESTON, TEXAS.

When asked to accept the chairmanship of the Section on Practice of Medicine and to present a report in the place of our Chairman, who is now away, I did so with some hesitation, owing to the short time that it gave me for preparation. I felt that I could hardly do justice to the Association.

Many subjects presented themselves, but none seemed to equal the importance of the one I have selected. I feel sure this Association acknowledges it as one of great importance to the Southern States, and to Texas especially.

Tropical diseases can not but appeal to all of us as of great concern to those of us who have lived in Texas long enough to see the prevalence of diseases peculiar to warm climates.

We are situated on the Gulf of Mexico, with a very extensive coast plain; and then our nearness to the West Indies, the Central and South American countries, and Mexico, put us practically within the influence of all of these tropical countries.

In discussing, for the short time at my disposal, tropical diseases, one must necessarily limit himself to certain phases. The subject is of so great magnitude that I have decided to consider only the following divisions:

1. What are tropical diseases?
2. Their importance.
3. The opportunity for their study in Texas.
4. The obligations to provide facilities for their study.

I. TROPICAL DISEASES.

The world has become so completely cosmopolitan that it is becoming more and more difficult to say just what diseases are limited to certain localities or climates.

At first glance one might say that the division into tropical diseases seems artificial, but when we study the fauna and flora we must come to agree that plants and animals seem fixed quite fast in their localities.

The study of disease is, and must necessarily be, a study of the fauna and flora. These are determined largely by the temperature, the moisture and the character of the soil. We are coming more and more to understand that in order to make progress in the study of disease one must be a biologist of the first rank. We must get a deeper insight into the plants and animals that inhabit different localities. Mason (*Tropical Diseases*) employs the term "tropical diseases" to include all those that occur in, or which from various circumstances are specially prevalent in warm climates.

Disease-producing organisms are either transmitted directly from one infected individual to another, where they rapidly multiply if the soil is suitable; or they are communicated through an intermediary host, such as the tick in Texas fever or the mosquito in malarial fever.

Thus it becomes a question, not only of a suitable climate for the disease-producing organism, but also of the necessary host which acts as an intermediate agent through which the organism may develop and be distributed to other individuals. Many of these intermediate agents are peculiar to, or are limited to, certain areas having a suitable climate.

For the prevention of disease in these localities one must have knowledge of a particular kind.

The habits and confines of the secondary host here become as important as the disease-producing agent itself.

II. THEIR IMPORTANCE.

No questions are more pregnant with interests of vital importance to the people of this section than that of tropical diseases.

Malarial fever, although not confined to tropical climates, yet on account of the increased productiveness of tropical climates in growing the intermediate host—the mosquito—becomes the most important disease of warm climates.

When we consider the number of deaths caused by the disease and the amount of suffering consequent upon it, we can not but admit that too little is being done to stop its ravages.

In addition to both deaths and great suffering, much wealth-producing power is lost.

The total number of deaths from malarial fever was 38 per 1000 for all known causes for the year ending May 31, 1900.

This, I am sure, was too much, as I feel certain many cases that are reported as dying from malaria died from some other cause. There are no records worth anything kept on vital statistics in Texas. Then, again, a diagnosis of malaria is often made on clinical symptoms only, and this method of diagnosis is unreliable.

The proportion of deaths was 14.9 to 1000 of all known causes in the United States. These estimates are more nearly correct because the figures of registration States are included. Of these deaths the total per 1000 from the different sections is shown below:

Southern Mississippi River Belt	88.8
South Atlantic Belt	61.7
Southwest Central Belt	57.9
Gulf Coast Belt	47.9

Taking our statistics in John Sealy Hospital, where routine blood examinations are made, we find that in 1901 there were 1115 cases treated in the wards—72 of these were malarial. This gives 1 to 15.5 of the pateints affected with malaria.

Galveston is not strictly a malarious locality. Of 481 cases admitted to the John Sealy Hospital in 1900, where a blood examination was made, 153 were malaria. More than 90 per cent. could be traced to outside infection (Moore, *Journal of Tropical Medicine,* March 15, 1902.) From January 1, to

November 1, 1901, I made a more careful inquiry as to the point of probable infection. Of the 421 cases admitted to the medical wards, 53 were malaria.

Four cases, or 7½ per cent. contracted the disease in Galveston.

This is presented here just for the purpose of showing the great prevalence of the disease. If Galveston, a practical malarial free city, has treated in the hospital one case of malaria to every 155 of the other diseases, how must it be in malarial localities?

Woldert (*American Journal Medical Sciences,* November, 1092) estimates that one person in every twelve is affected. Our population in 1900 was 3,048,110 (U. S. census). One-twelfth would give 237,392 persons in the State sick of this disease. Now supposing one-fifth of these are heads of families, it would give 47,478 men sick each year of this disease. Think of the economic loss here!

Since the discovery of the means of infection by the secondary host, the mosquito, the prevention of malaria resolves itself largely into operations against that agent.

Rice growing in the coast region will increase the number of cases of malaria many times. What is the remedy? These are but suggestions.

Yellow Fever.—The relation of our position with reference to the very habitat of this fever puts it next to malarial fever in importance among the insect-borne diseases.

The older members of this Association can easily remember how it swept away many of the citizens of this State in 1867.

We have the *stegomya faciata,* the proven carrier of the yellow fever organism in our chief port city in great numbers. I have several times caught them while sitting in my office. They must be abundant all along the coast. They ought to be studied, i. e., we ought to know the localities in which they live and breed, and also know more of their habits. Were yellow fever introduced into our midst, it would spread with great rapidity, unless we could quickly avail ourselves of the means now at our command to fight it.

The whole question seems to resolve itself into a campaign against this particular mosquito.

In Havana (Gorgas, *Journal of Association of Military Surgeons,* April, 1903), the average number of deaths from yellow fever for 30 years was 706.

During the year preceding the mosquito campaign there were 310 deaths. The number during the first year of the work was 18, and 13 of these occurred before the work began.

Havana is now, and has been for two years, free from yellow fever. We are to dig the Panama canal and establish a close relationship with countries in South and Central America, where this disease is epidemic. There are vast interests at stake. Then again, the United States is not only to protect herself against this disease entering and preying upon her people, but she is to fit medical men to make Central and South America as habitable as Havana has become, and prevent the spread of this scourge to the densely populated tropical countries of the East.

The work of Carroll, Reed, Lazear and others must not be wasted.

Amœbic Dysentery.—Here we have hundreds of cases of this disease. The total number of deaths from this disease in 1900 was 6112. The total deaths per 1000 from diarrhœal causes in the gulf coast region was 89.9. The highest mortality area for this disease that we have is about central over Texas.

Bubonic Plague.—This disease carries off thousands of victims in districts where it has been introduced, especially in overcrowded and filthy cities. It has been introduced into this country at several points. There has been 94 cases at San Francisco since the outbreak in March, 1900. There has been quite an outbreak in Mazatlan, Mexico, during this year.

Dengue.—This disease, which is strictly limited to the tropical climates, attacked about one-third of the entire population of the coast country in 1897.

Wilkinson (*History of the Dengue Epidemic in Galveston*) estimated that half of the population of Galveston were attacked.

One could go on and on showing the great importance of this subject, but time will not allow.

II. THE OPPORTUNITY FOR THEIR STUDY IN TEXAS.

I have not named quite a number of tropical diseases, waiting to discuss them under this heading.

Malarial Fever is found in this State in almost every community. The parasite can be gotten for study at any time. The malarial-bearing mosquito is here and is awaiting some one interested in working out its habits, distribution, etc.

The *amœba* and its relation to dysentery has been studied carefully by many observers. They are abundant here. Dr. George Dock, of Michigan University, while in Texas, contributed much to our knowledge of this parasite.

We have the *bacillic form of dysentery,* to which Dr. Simon Flexner has given much study, and with such brilliant and far-reaching results.

Beri beri probably could be found in this State, were it more fully recognized and searched for. I reported four cases on shipboard in 1899 (*Univ. Medical,* Vol. IV, No. 6).

The extensive rice plantations of our coast region must arouse our interest in the theory of rice carrying the source of infection. It should be worked out here in this and adjoining States.

Malta fever has been found in this State. We are honored with a paper on this subject by Dr. Chas. F. Mason, U. S. A., to be read before this Section. Curry (*Journal Medical Research,* Vol. VI, No. 1) reports eight cases from Hot Springs, Ark. We probably have it in our midst many times and not recognized.

Dengue.—There have been several epidemics in this State. Dr. J. W. McLaughlin, University of Texas, thinks it due to a micrococcus, while Harris Graham (*Medical Record,* February 8, 1902) thinks it due to a protozoan, much like the protozoan of malaria.

Intestinal Parasites.—These exist, I am sure, in as great a variety probably as in any place in the world. Dr. Charlotte Schaeffer reported the first case of *anchylostoma* here (*Medical*

News, 1901). Dr. C. W. Stiles has shown how widely distributed it is in Georgia, Alabama, Florida and other States. Dr. A. J. Smith reports eight cases (out of 80 persons examined) found in medical students from different portions of the State. (Paper to be read before American Medical Association, May, 1903, at New Orleans.

I have reported a case of *strongloides intestinalis* (*American Medicine*, May 30, 1903), found in Galveston. I have two other cases to report. I shall present to this Association, in the Section of Pathology, the first or second case of *Tænia nana* found in North America, so far as I know.

(A preliminary note has been published on the *Occurrence of Tænia nana in Texas*, University Medical, April, 1903.)

Dr. Stiles writes me that since I reported my case to him, he has found four cases in Georgia and one in Washington. I have no doubt that many others will be rapidly added as we systematically examine the fœces of our patients.

Filaria probably exists here. They are common in the West Indies; why not here?

Trypanosoma, a new parasite of the blood, is found in similar climates. Our communication with Africa is close enough to make it necessary that we know something of it.

Leprosy is also found quite frequently in this State and is, no doubt, quite often overlooked. I know of several cases in Galveston.

IV. THE OBLIGATION TO PROVIDE FACILITIES FOR THEIR STUDY.

Opportunity and obligation are indissolubly bound together. No one would for a moment deny that these are questions of great importance and great moment to be worked out in the prevention of the spread of these tropical diseases that are already here, and others that will likely be introduced, unless prevented.

What is the remedy? I think medical men ought to be especially trained in the study of tropical diseases, so that they may be prepared to handle the great problems for preventive tropi-

cal medicine that have been thrust upon us by our location within the warm belt, and by our contiguity with tropical countries with which we are establishing such close commercial relationships.

Then again, we have added to our possessions tropical countries, and our soldiers and people are passing hither and thither, unconsciously making our disease *fauna* and *flora* more cosmopolitan.

The State should not only contribute bountifully toward the equipment by training medical men to teach what is known of these diseases, but she should go further; there is badly needed in this State, and right now, too, men who could devote their entire time in research work along the lines spoken of but briefly above.

Would it not be wise for our State, through the regents of the University, to not only make it possible for men who desire to work along these lines of research to do so, but to make it the duty of those connected with her institutions of learning?

For one to do this character of work, money is needed, and routine work must be removed from him, so that he is given an opportunity to work. Then again, assistants are needed. They must be secured. These should be provided and placed under the direction of those conducting the work of investigation. The State would soon then become a producer instead of a middleman, handing out knowledge of things worked out by others.

Then, from an economical point of view, it would pay. Unless we work these problems out for ourselves, we must necessarily wait a long time. These opportunities are here; shall we embrace them?

I wish to conclude this address with a quotation from Dean Allan J. Smith's report to the regents of the Medical Department, University of Texas:

"It must be acknowledged, no matter how efficient the school is proving itself as an institution for undergraduate instruction, that in part it is far behind even less pretentious medical colleges of the country. This refers to the amount and character of

original scientific work done by the teaching staff and the advanced students. In one sense this is immaterial as long as the fundamental medical educational work, for which the school primarily exists, is being done; but in other senses it is a serious failure. Science has been making great strides in the past generation; even when it is acknowledged that the term science has been burdened with much that is unworthy of the name. It is clearly the part of every scientific institution to do a part of the advance. This is particularly true when in its relations such an institution is surrounded by special problems. The medical school at Galveston, the furtherest Southern medical institution in the United States and closely related by trade with the tropical regions, is in exceptional position for the study of tropical and subtropical diseases; and with the material for observation now possessed there, frequent opportunity for observation in these lines which can, in the existing conditions, have but little attention paid to them. The questions concerning malaria and its transmission, dengue, yellow fever, tropical hepatic abscess, a number of parasites of man and their transmission through lower life, occur time and again; but the full attention necessary for their solution fails because of lack of time for such work at the hands of the individuals here who are interested and for lack of special facilities.

Such work should be done as a matter of practice for the existence of the school and in its performance it would undoubtedly redound to the greater credit of the institution. The great obstruction is the lack of time after the routine work of class instruction has been performed.

DIPHTHERITIC PARALYSIS.

J. S. LANKFORD, M. D.,

SAN ANTONIO, TEXAS.

Three fatal cases of diphtheritic paralysis occurring in my own practice in rapid succession has so profoundly impressed me with the importance of the subject that I have concluded to report them in the hope of eliciting discussion, and gaining valuable information.

CASE 1. Miss H., age 14, had a trifling sore throat and consulted a physician. He saw nothing in the case that seemed important and prescribed a simple gargle. The young lady went away to school in a neighboring town in a day or two, though not feeling very well. She entered school, was dull, lacking in energy, made no progress, and was repeatedly chided by her teacher for indifference. After three weeks of useless effort in school it was discovered that her sight was defective, and she was brought to the city to see an oculist. He found beginning atrophy of the optic nerves, and some paralysis of the ocular muscles. Two days later she had difficulty in swallowing and was referred to a throat specialist, who found extensive paresis of the muscles of deglutition. A day or two later irregular heart action was noticed, and complaint was made of numbness in the legs, and two general practitioners were called. On the following day breathing was irregular and marked general weakness was noticeable with various abnormal sensations in different parts. General partial paralysis rapidly followed, the pneumogastric and the phrenics showing most disturbance, extreme irregularity of the pulse and sighing respiration being especially marked. Death occurred the sixth day after reaching the city, the heart continuing to beat for some time after breathing stopped. The physicians all agreed that the case was diphtheritic paralysis. Other cases occurred afterwards in the community.

CASE 2. Corine R., age 7, had a typical case of diphtheria of moderate severity. Not deemed serious enough to require antitoxin. The child never seemed very sick, but convalescence was tedious, and attended by great languor. The twelfth day mild throat paralysis appeared, but caused no apprehension until the fifteenth day, when the child complained of the right leg being asleep. Careful examination of the heart showed slight irregularity. This condition kept up several days, the heart action growing worse, and the child complaining bitterly of the abnormal sensation. Great weakness was constant. About the twentieth day she raised up in bed crying, with her leg, and fell back dead, presumably with paralysis of the heart.

CASE 3. Roy S., age 6, was brought in from the country with a most malignant case of diphtheria, with larynx, pharynx, tonsils, fauces and nasal cavities involved with membrane. Horribly offensive bloody discharge dripped from the nose continually, suffocation was threatened, and tracheotomy seemed imminent. Prostration was marked, temperature never very high. Two thousand units of antitoxin was given, quickly followed by fifteen hundred. Great improvement was apparent in a few hours and the danger of suffocation soon passed. During the next few days the membrane loosened up and disappeared by sloughing and constant cleansing with peroxide of hydrogen. The child was critically ill, but everything went along fairly well till the fourteenth day, when difficulty in swallowing was noticed. Having just lost case No. 2 four weeks before, the appearance of paralytic indications were watched in this case with keen anxiety. On the fifteenth day the heart dropped a beat every minute or two. In the afternoon vomiting began and continued for two days and nights, in spite of every effort to relieve him. The heart soon showed great weakness and marked irregularity. The seventeenth day breathing was slightly irregular, and there was a general paretic condition. The eighteenth day vomiting had practically ceased, but the outlook was gloomy. The heart had responded to strychnia and was stronger and more regular, but breathing had become decidedly involved. At an early afternoon

call I found pulse 60, and regular; breathing very bad. During examination patient complained for the first time of his leg being asleep, and cried because of the discomfort. During the next few minutes the pulse dropped down to 50, 40, 30. At this time the diaphragm seemed to become suddenly completely paralyzed, respiration being performed entirely by the chest muscles. The heart slowed up to 20, the pupils suddenly dilated widely, the heart stopped, and efforts at respiration were continued for nearly a minute by the muscles of the upper part of the chest and neck. Strcyhnia and supportive treatment was the main reliance in all three cases Electricity seemed of little avail. Potassium iodide seemed to be beneficial in case No. 2.

Many years ago I had one similar fatal case, but since that time so many simple cases of throat paralysis complicating diphtheria have come under my care, all apparently so trivial and curable that the condition had ceased to give me any concern. With my recent experience, however, and the vivid recollection of my utter helplessness in these cases, I shall watch for this complication with great uneasiness in the future. What the condition is, whether it is a toxic neuritis produced by the Klebs-Loeffler bacillus, or a product of those germs, whether the streptococcus or other germs may play a part in some cases, and whether some cases may be due to brain pressure from effusion or stasis of circulation dependent primarily upon weak heart, I am unable to determine conclusively. The wonderful variation in symptoms would indicate a variety of causes.

I hope a free discussion may throw some light on the causation of this important condition, and that it may also indicate the best treatment.

DISCUSSION.

DR. W. A. HARPER, Austin: I do not like to see this paper go by without some discussion. I have seen similar cases in my own practice, and *one* just like Dr. Lankford's second case. I believe in these light cases of diphtheria, the physician should keep a sharp lookout and examine the heart, and watch carefully for symptoms of paralysis from day to day, for at least two weeks, that he may be prepared to do something in time. Almost every physician has had some experience with these extremely

light cases, in which the patient does not even go to bed. These are the cases that die unexpectedly; therefore, we should watch them very carefully.

DR. W. B. COLLINS: I want to thank Dr. Lankford for this very interesting and valuable paper. This is a subject which should interest every physician present. I find that he had has some of the same experiences which I, from time to time, have had with this dread malady. Several years ago, we had an epidemic of diphtheria in my town which in the beginning was quite confusing. The cases were nearly all typical, in so much that the local profession were very much divided as to whether it was diphtheria or not. Finally, to remove all doubt, I sent a specimen of the membrane to Dr. A. J. Smith, of Galveston, for microscopical examination. He found the genuine Klebs-Lœffler bacillus. This satisfied me as to the nature of the disease. I treated it after the old orthodox plan.

The mortality was, as you may suppose, very great. I believe that under the old "drug" plan of treatment, it is one of the most treacherous diseases in all the nomenclature of medicine. I recall several patients which I had dismissed, believing them convalescent, and would be suddenly recalled to witness a death, either from paralysis of respiration, heart failure, or both. Up to this time, i. e., Dr. Smith's report, I had never used antitoxin. Owing to the fact that the profession at that time were very much divided, and my clientelle strenuously opposing experimentation, and, I might confess, to a lack of moral courage on my part, I had not employed this great boon to suffering humanity. Necessity, however, drove me to it, and the results of its use have been most gratifying.

Now, in conclusion, I want to warn you to look with a suspicious eye upon all forms of inflammatory throat trouble. Antitoxin within itself is entirely harmless. Use it early and persistently, and I feel sure you will be rewarded with a minimum death rate. I regard it as the remedy par excellence in treating diphtheria.

DR. C. W. GODDARD, Holland: I desire to make mention of two cases that my partner, Dr. Crosthwait, saw last year with another physician. Both boys, ages 5 and 7 years; both taken with typical diphtheria. The ordinary lines of treatment, together with diphtheritic antitoxin were administered; the exudate disappeared from tonsils and fauces, temperature became normal, pulse improved to nearly normal conditions; all indications were that convalescence was well established, when, at the end of the second week in one case, and two days later in the other, symptoms of heart paralysis developed, which gradually increased, causing death in both cases two days after its development.

MALTA FEVER.

CHAS. F. MASON, U. S. A.,

SAN ANTONIO, TEXAS.

I wish to call your attention tonight to a case of Malta fever I have recently had under treatment at the post, the first, I believe, ever reported in Texas, and one of about a dozen in the United States, all imported.

The first case was reported in Philadelphia, in 1898, by Musser and Sailer, in the person of an officer recently returned from Porto Rico. The second case reported among United States soldiers was also a patient of mine in the General Hospital at San Juan, Porto Rico, and was reported by my pathologist, Assistant Surgeon Walter Cox, U. S. Army. Before giving you a history of the present case I will refresh your memory by a brief resume of this, to us, rare disease.

The disease is variously known about the Mediterranean, which was supposed for a time to be its only habitat, as Malta fever, Mediterranean fever, Rock fever, Neapolitan fever and undulant fever. Now we know that it prevails also in the West and East Indies, in India, China and the Philippines, and is probably much more widely distributed than is generally supposed.

It is a specific, infectious fever, endemic or epidemic at times, due to the micrococcus melitensis of Bruce, characterized by a long-continued, undulatory fever, with remissions or intermissions, enlarged spleen, profuse sweats, arthritis, neuralgia, and sometimes orchitis. Other features are constipation, anæmia, low mortality (2 per cent) and tedious relapses.

The disease is not contagious; it occurs especially in the summer, earlier than typhoid. The micrococcus is not found in the blood during life, but is abundant in the spleen; it gives a characteristic

agglutination with the blood of sufferers from the disease and is even more sensitive in this respect than the bacillus typhosus.

The infection seems to be a place infection, and is favored by unsanitary conditions; but whether it is water or air borne, or both, is not determined. A number of instances of accidental laboratory infection have occurred.

The incubation period is generally about five to ten days, though it may be as long as seventeen days. One attack usually confers immunity.

The symptoms are not especially distinctive in themselves: headache, loss of appetite, constipation, fleeting swellings of the joints, obstinate neuralgias, night sweats; the sign that usually catches the attention is the temperature curve; waves of fever lasting one to three weeks, and followed by an intermission or remission of two or three days, and this continued for weeks, months, even as long as two years; the patient, though weak and anæmic, does not look seriously sick. Quinine has no effect. Examination of the blood is negative for the plasmodium and for the Widal reaction, but is positive with the micrococcus melitensis.

The treatment is symptomatic.

I will now describe my latest case:

Sergeant Frank J. Reiner, Company E, 4th Infantry, was transferred to this post December 14, 1902, for observation and treatment. He came from Fort Ringgold, Texas, with a diagnosis of "chronic malarial fever, malarial cachexia, complications: chronic muscular rheumatism."

Upon admission he was anæmic, with an enlarged spleen, and complained of marked sciatica and pains in the right shoulder; constipated. He gave a history of what he called "rheumatism and malaria," with fever more or less constant for several months.

His blood was examined repeatedly (always with negative results) for the plasmodium, and for the agglutination tests with the typhoid and para-colon bacilli. Finally, recalling my Porto Rican experience, I had his blood tested with the micrococcus melitensis with positive results, thus clinching the diagnosis.

He stated that he had been in the service eighteen years; had served in Cuba during the Santiago campaign, and had had some rheumatism after he returned; afterward served in the Philippines from the 10th of May to the 31st of December, 1899, and from June to December was on sick report with rheumatism; was then invalided home and spent a month in the General Hospital at Presidio, California, going thence to the hospital at Hot Springs, Arkansas, where he remained until June 1, 1900. After leaving the hospital he was well until September 29, 1902, when he entered the hospital at Fort Ringgold for fever and rheumatism, and remained there until his transfer in December. So you see that from June, 1899, to June, 1900, one year, he was continually on sick report for rheumatism and fever of which we have no record; he was probably suffering from Malta fever at that time.

He next appeared sick in September, 1902, and had a practically continuous fever until January 3, 1903.

I will now read you his history as received from Fort Ringgold:

"Sergeant Frank J. Reiner, Co. E, 4th Infantry, was admitted to hospital September 29, 1902, after some time of treatment in quarters for what was believed to be a return of malarial fever. His history shows that he had fever in Cuba in 1898 and a return of the disease in the Philippine Islands, and was sent to the United States as a patient—from the Presidio he was sent to Hot Springs, Arkansas, and was treated in the Army and Navy General Hospital for 'rheumatism.' The present attack has been slow in its approach.

"The first admission to sick report was August 11, 1902; then again sick in quarters August 23rd to August 25th on account of sciatic neuralgia. The symptoms of greatest severity shown during the course of the disease have been constant pain upon moving the neck and upper dorsal region, painful to the touch or least pressure made upon the skin covering the spinous processes; pain, especially in the sciatic nerve, right side, pain in the region about the hip joint, at times in both shoulders; with this there has been a growing weakness in the lumbar and gluteal regions that has made walking

difficult, and painful points, not in the sciatic nerves as expected, but for the most part in the nerves sent to supply the hip joints and the gluteal muscles.

"Malarial cachexia has followed this irregular, continued fever. Anæmia is present, yet the fever had scarcely disturbed his appetite; the bowels have been regular, and sleep disturbed only as in cases of chronic rheumatism.

"The pain and inability to use the hip muscles in walking is believed to be the result of malarial neuritis.

"All symptoms were improving at the time of his leaving the post."

The charts which I pass around will give you a fairly good idea of the course of the fever.

DISCUSSION.

DR. H. W. CROUSE, Victoria: One thing I should like to know is something about the treatment. Did you use quinine in any form?

MAJOR CHARLES F. MASON, U. S. A.: In the first case named, in which the diagnosis of Malta fever was made and the malarial organism was not found, I tried quinine sulphate, which had no effect; then I tried potassium iodide, and that had no effect, and finally I gave him a tonic of iron, quinine and strychnine, together with laxatives to keep his bowels open; on that he improved. I treated the case about six or eight weeks.

DR. H. A. WEST, Galveston: Did you cure him or did he get well?

MAJOR CHARLES F. MASON, U. S. A.: He got well; has never been sick since, and is now in service.

DR. H. A. WEST: Since hearing the paper of Dr. Mason on Malta fever, the idea has occurred to me of the possibility of the more frequent occurrence of such cases in Texas, which are unrecognized—for example, some of those cases diagnosticated as chronic malarial fever, which failed to yield to thorough cinchonism, may belong to the category of Malta fever. We should certainly be on the lookout for such cases.

DR. JOHN T. MOORE, Galveston: I have been noting with great interest that a number of diseases that we supposed did not exist in this country were here, and as our knowledge of them increases they become more numerous. The discovery of uncinaria is a striking example. Now, Dr. Mason comes forward with a case of Malta fever. I think we have a case

in the wards of the Sealy Hospital. I am very sure, since hearing this paper, it is a case of Malta fever. The man has been the rounds from Cuba to Porto Rico, and then from Porto Rico to San Francisco, across to the Philippines, and from the Philippines to China, then to Japan, and thence back to San Francisco. A diagnosis has been made of neuralgia, rheumatism, chronic malarial fever. The joints of the index finger of the left hand have commenced to pain him. He also has pain in the side of the face, involving the fifth nerve. I have examined his blood for the malarial parasite, and at night I have examined for the filaria, with negative results. I expect to make other examinations when I return home. The agglutination test should be made. I believe with these methods of diagnosis that the cases we have been treating for a long time as chronic malaria, chronic rheumatism, and chronic this or that, will some of them turn out to be Malta fever.

MAJOR CHARLES F. MASON, U. S. A., in closing, said: That the diagnosis of chronic rheumatism, or chronic malaria, is always a suspicious diagnosis to me, and I am never willing to take it, and if you investigate these cases, especially if you make repeated examinations of the blood and the excretions, you will find that chronic malaria will become very much less frequent in this country.

I also wish to say, in this connection, that the number of tropical diseases in this country is increasing, because the soldiers coming back from the Philippines bring them with them. Our troops that are now at home in San Antonio are much troubled with this Dhobie itch, which I believe is getting a strong hold here.

SOME REMARKS ON THE SUBJECTIVE SYMPTOMATOLOGY OF HEART DISEASES.

H. A. WEST, M. D.,

GALVESTON, TEXAS.

The word subjective, as applied to symptoms, is defined "as those symptoms experienced by the patient himself, and not amenable to physical exploration." For the purpose of this article I prefer to include in the list of subjective symptoms some of those that are objective also, as for example, dropsy, tachycardia, bradycardia, and symptoms relating to the renal secretion, which are both subjective and objective.

In these days when the importance of objective methods and laboratory diagnoses are considered of paramount importance there may be a tendency to minimize the significance of those symptoms which bring the patient to the doctor or compel him to send for the physician.

We should not forget in this connection the great diagnostic skill of our forefathers in medicine, who were enabled by the consideration alone of the subjective symptoms to make a diagnosis with a skill and rapidity which to us almost seems marvelous, when we call to mind that most of the methods of physical diagnosis were entirely unknown to them.

The intention of this article is to call renewed attention to the importance and significance of the subjective symptomatology relating to diseases of the heart. Like a lighthouse on a dangerous coast, or a guide-post at the crossing of the ways, these symptoms are the danger signals which indicate the seat of the disease in advance and direct the physician to various methods of physical examination.

In regard to the respective significance of the subjective and objective symptoms of heart disease, it is important to bear in mind that many symptoms indicative of heart trouble may occur entirely

disconnected with any disease of that organ, but an aggregation of symptoms showing a disturbed circulation is extremely suggestive, and in many cases a diagnosis of cardiac disease may be made entirely irrespective of physical signs. It is also important to bear in mind that such aggregation is not indicative of cardiac disease only, but is significant of ruptured compensation, of serious circulatory disturbance, of decreased arterial pressure, or transference of pressure from the arterial to the venous side of the circulation, hence conveying to us not only the knowledge that heart disease is present, but that the condition is a serious one, demanding careful therapeutic measures; whereas, on the contrary, we may have the presence of a very positive physical sign without any disturbance whatever of compensation, the patient himself having no intimation of any heart trouble, and where serious consequences may ensue if the knowledge is accidentally or of purpose conveyed to him. For example: If I was to ask what was the most important sign or symptom of heart disease the answer would probably be in nine cases out of ten "the existence of a cardiac murmur," while the truth of the matter is (we have the highest authority for this statement) that murmurs are really themselves of least diagnostic value: first, those of exocardiac may simulate those of endocardiac origin; second, because murmurs truly of valvular origin may disappear for the time being or permanently; third, we may have murmurs of valvular origin, but without permanent valvular lesion, which may disappear, leaving the heart uninjured; fourth, we may have murmurs of valvular origin, which may disappear temporarily, or even permanently, the lesion still continuing. Many serious forms of heart disease, productive of a long series of circulatory disturbances, are entirely disconnected from valvular disease, and hence unattended by murmurs; for example, various forms of myodegeneration, hypertrophy and dilatation due to a variety of causes.

It is obvious, therefore, that murmurs of themselves can not be accepted as certain indications of cardiac disease, even if we can positively connect them with lesion of definie origin, because that

lesion may be temporary in its character and entirely disconnected with actual disease of the valve affected.

I shall not stop here to speak of the differentiation between murmurs of exocardiac and endocardiac origin, but only mention the great importance of making such distinction. It is well, however, in this connection to emphasize the importance of the fact that many murmurs, apparently due to incurable lesions, may depend upon those which are curable, and, therefore, that the murmurs may not only disappear, but the heart itself become perfectly rehabilitated. Failure to bear this fact in mind has led to some deplorable results. When patients are informed of the presence of a heart lesion, they connect same with sudden death, have been led to lead a life miserably unnecessary in its restrictions and results, hence the great care a physician should exercise in informing any patient as to the presence of a heart lesion, basing his diagnosis upon physical signs alone. I call to mind in this connection a case which recently came under my observation. A young man, about five or six years ago, had a loud heart murmur, and in fact was apparently the subject of an incurable lesion. Examination a few days ago revealed the fact, not only of the entire disappearance of the murmur, but of all evidence of any cardiac disease whatever.

The subjective symptoms to which I wish to direct attention on this occasion are as follows: Precordial anxiety, palpitation, irregularity and intermission, tremor cordis, tachycardia, bradycardia, delirium cordis, breathlessness, cough, hæmoptysis, pain, dropsy and symptoms of digestive disturbance, renal symptoms, menorrhagia and cerebral symptoms.

As regards *precordial anxiety,* we understand by this term a feeling of emptiness and uneasiness in the cardiac area, rendering the presence of a heart conscious to the individual. In normal conditions this organ works with such ease and comfort that the person hardly knows he has a heart. In the presence of precordial anxiety, however, the apex beat will be found to be weak, hardly perceptible; the heart sounds enfeebled; indications of weakness of the myocardium; the heart, being weak, is irritable and its action likely to

be excited or deranged by mental or physical exertion or causes of disturbed inervation. Accompanying precordial anxiety we are apt to have palpitation and irregular heart action in relation to its force and rhythm.

The term palpitation is applied to all forms of abnormal cardiac pulsation, which make themselves unpleasantly sensible to the sufferer, and include intermission as well as irregular action. The distinctive peculiarities of this symptom consists in the regular, rapid and violent pulsation of the heart, oftentimes shaking the entire chest and making itself disagreeably sensible to the sufferer, accompanied by throbbing in the larger arteries, but not extending to the smaller vessels. It usually comes on suddenly, and may last for a few moments to several hours; it is distressing and alarming to the sufferer, but not ordinarily a dangerous symptom; it is apparently due to reflex inhibition of the pneumogastric nerve with reflex paralysis of the inhibitory center, removing the controlling influence of the vagus and allowing the augmentor to temporarily run off with the heart. It occurs in hysterical, anæmic and dyspeptic persons, and may be entirely disconnected with any organic cardiac disease. On the contrary, it may be symptomatic of almost any form of heart disease, involving the valves or cardiac muscle itself. The determination of the diagnostic importance has to be reached by further study of this case and the presence of other symptoms or physical signs.

Intermission and irregularity are also due to reflex inhibition of the heart through the vagus, and, while they may be of little importance in youth on account of the large margin of reserve strength, become of much more serious import after middle life, because the conditions, if present, are accentuated and the tendency of persistent intermissions to induce dilatation and its consequent disturbance of the circulation. This inhibitory influence may be of almost any character and comes from divers sources; it may be of physical or emotional origin, a diseased organ, depraved nutrition, or mental shock; violent emotion, if even of a pleasant nature, may be sufficient to fatally injure the heart's action. Railroad accidents are

not infrequent causes inhibiting even a strong heart and causing it to intermit, but in persons the subject of heart disease, compensation may be ruptured by such a shock, causing the individual to become a permanent invalid, and finally causing death.

The intermission and irregularity, due to stomach irritation, arising from flatulence, undigested food or other disturbance, also those intermissions due to the abuse of alcohol, tobacco or similar poisons, fortunately may easily be removed; but to a person in advanced life they require careful attention and recurrence prevented if possible.

Another common cause of irregular and intermittent heart action is due to anæmia. Here we have the effect of the impoverished blood producing its deleterious influence by the imperfect nutrition of the cardiac muscle itself, resulting in either very rapid action, in which the heart attempts to increase its nutritive supply by this method, or resulting in some form of irregular action.

Tremor cordis is another remarkable form of irregular heart action, the very opposite of palpitation, the emotions having nothing to do with the causation; the heart, instead of throbbing, trembles like a leaf. It is a most alarming symptom, not only from its peculiar character, but on account of the sudden way in which it seizes its victims, the heart having previously been beating quietly and steadily, suddenly becomes rapid and tumultuous; life itself seems slipping away when the heart trembles. These attacks come on without warning, usually passing off shortly without any serious detriment. These cases are spoken of as "fluttering of the heart." The pulse does not die away, but suddenly drops from the ordinary full pulse to a mere tremulous thread. In these cases there are generally a series of imperfect systoles, during which time the ventricle is becoming overfilled; then an augmental wave is called into play, the ventricle forcibly expelling its centents, the heart then settling into its ordinary rhythm. These cases of tremor cordis can usually be associated with flatulence or some other stomach disturbance; emotional influences have no share in its causation.

Coming now to speak of *tachycardia,* or heart hurry, this is a physiological phenomenon in the new-born, where the heart beats at

the rate of about 120 per minute; in pathological tachycardia the heart rate is said to have reached a rate of 200 or 300 per minute. The peculiarity of pathological tachycardia is the little disturbance it causes to the sufferer; with a heart beating more rapidly than that of an infant the patient may go about his duties as if nothing was the matter. This is an important distinction between tachycardia and palpitation, with which it is apt to be confounded. Tachycardia is observed occasionally in women during the menstrual period or during the puerperium, and is occasionally observed in convalescence after acute diseases; the last cases are morbid in their causation and usually disappear when the cause is removed.

In regard to those cases of tachycardia where this appears to be the only detectable symptom, on careful inquiry you generally discover some previous heart strain sufficient to originate an endocarditis or myocarditis, or some co-existent chronic disease or history of some overwhelming emotion, or abuse of some kind of the cardiac organ, any one of which might be sufficient to account for this symptom.

Of all valvular lesions tachycardia appears most frequently to be connected with mitral stenosis, and in every such case evidence of this lesion should be carefully sought. On the other hand, when the heart is found to be enlarged and dilated with persistent tachycardia, suspicion should be directed to impairment of the coronary circulation or of some condition involving imperfect metabolism of the myocardium; in the latter half of life tachycardia is symptomatic of various forms of mild degeneration, and, if not at first dependent upon cardiac disease, is always associated with dilatation.

Among the poisons producing this symptom the most important is alcohol, which probably acts by producing neuritis of the vagus, ultimately inducing a fibro-fatty degeneration of the myocardium; excessive use of tea and coffee and tobacco should also be taken into consideration in the production of this symptom. In fact, there is nothing of a neurotic or organic origin which may not act as an excitant to tachycardia. All kinds of emotional and psychycal

impressions, all sorts of neuroses, hysteria, epilepsy, neurasthenia in its various forms, dyspepsia, disturbances of the liver, floating kidneys, prostatic disease, abdominal tumors, intestinal worms, various forms of neuralgia, may at all times prove exciting causes of paroxysms of accelerated heart action of shorter or longer duration. In women these attacks are most prone to occur at the menopause or disturbance of the function of menstruation; then again, as an exciting cause there is no doubt that in breaking down of the general health or any anæmia that may be present acts as a powerful predisposing cause, especially if combined with a disposition to gout and if present after middle life. In conclusion in regard to those symptoms, I should mention that tumors, often of small size, pressing upon or involving the pneumogastric nerve, are well-known causes of this symptom, which is not simply paroxysmal, but continuous, and in the end fatal.

Bradycardia and Delirium Cordis.—Bradycardia, the opposite condition from tachycardia, means an excessive slowness of the heart's action. It is important to distinguish between the true and the false bradycardia; the latter condition may be called "delirium cordis," depends upon feeble ventricular contractions, resulting in a failure of the blood wave to reach the periphery. In a certain proportion of cardiac pulsations occasionally every alternate beat is dropped and at other times two or more, thus the heart may be beating at the rate of 60 a minute, the radial pulse may only be 20 or 30. This condition can very easily be determined by a comparison of cardiac pulsations with the radial pulse; the abnormality depending in many instances upon some remote cause; has a very different prognostic signification from true bradycardia, the latter belonging to another and much more serious condition.

In determining the presence of a genuine bradycardia, it is important to remember that in some persons the normal pulse is unusually slow; occasionally it never rises above 60, and in a very few it may even be as slow as 48; consistent with perfect health. Cases reported of 20 to 30 beats a minute, in the absence of any pathological condition, should be regarded with suspicion, as most,

if not all, of such cases, will sooner or later be found to have suffered from some abnormality.

The association of bradycardia with fatty degeneration of the heart has been found experimentally to have been a delusion, and where it does exist it is accidental only.

Most cases of bradycardia are due to traumatism of the cervical vertebra, involving an injury of that portion of the spinal column. The explanation of this causal relation is that from this portion of the cord the spinal accessory nerve arises; this nerve acting the part of the anterior column or root of a spinal nerve, even a concussion of the cord at the origin of the spinal accessory will produce a temporary slowness of the pulse, while severe injury of the cervical part of the cord or disease of the cervical membranes, or disease or injury at the base of the brain, involving a compression of the above mentioned nerve, will produce permanent slowness of the pulse.

The action of many poisons in slowing the heart is explicable by the influence such poisons have upon the nerves and nerve centers. Cases of severe bradycardia are always associated with dilatation of the heart and usually attended by a mitral systolic murmur.

The condition mentioned as *delirium cordis* is comparatively common in gouty and dilated hearts, as a temporary phenomenon; treatment directed to the restoration of the compensation usually removes such condition, unless the lesion has progressed so far as to be irremediable.

Breathlessness.—This symptom is of very great importance and significance in cardiac disease. When we come to consider the numerous and diverse methods by which this symptom may be produced in diseases of the heart, we can fully appreciate the frequency with which a disturbance of pulmonary function may occur. I merely mention here some of those mechanical causes serving to intensify the breathlessness in heart disease, viz.: excessive hypertrophy, pericardial or pleuritic effusion, catarrhal and œdematous conditions from serous effusions, pulmonary infractions, due to thrombosis and embolism, possibly resulting in pulmonary gan-

grene, pneumothorax occasionally, hemorrhages, depending upon intense congestion of embolic infraction. In addition to all of these mechanical causes we have that characteristic breathlessness or "air hunger" of the Germans, due to disturbances of the pulmonary circulation alone, in which, in the entire absence of any obstruction to the entrance or the exit of air from the lungs, the patient may suffer from breathlessness, due entirely to a deficient oxygenation of the blood. The peculiarity of this form of breathlessness consists in that it is manifested only upon exertion; it is one of the earliest and most significant symptoms of a ruptured compensation. During quietude the heart may be enabled to carry the blood with sufficient force through the lungs, but upon the slightest exertion a passive congestion occurs in the lungs, leading to deficient oxygenation; hence I am in the habit, in every case where I suspect heart disease, to inquire particularly as to whether the patient suffers from shortness of breath after even slight exertion.

The amount of lesion is not to be measured by the extent of breathlessness, but its gravity is dependent upon the degree in which the compensation is broken, may certainly be so: thus a patient may only blow a little in going up a hill or ascending a stair, or his shortness of breath may be so great as to compel him to stop on attempting either of these feats, or it may be so extreme as to be distressing on making such trifling exertion as sitting up or turning in bed; at the same time there is no true dysponœ; that is to say, there is no obstruction to either inspiration or expiration, and there may be no curtailment of air space. The breathing while the patient is at perfect rest is quiet and natural, yet from cardiac causes the difficulty is so great of getting the blood aerated, that the slightest exertion produces a gasping disquietude, extremely characteristic. There is another form of cardiac asthma, so-called, which, though not dependent upon exertion, is equally independent of pulmonary lesion. In these cases the condition comes on suddenly; frequently when the patient is asleep he is awakened with palpitation, pain, weakness of the heart, and occasionally nausea and vomiting. This form of cardiac asthma is most usually senile

and associated with mild degeneration, rather than valvular lesion. It is usually brought about by some reflex gastric disturbance affecting an enfeebled heart in this unusual manner. It is often the beginning of the end of those affected and the first intimation of the approaching end.

In this connection, it is important to remember that cardiac breathlessness is not necessarily due to actual cardiac disease, as it may be dependent upon some abnormal condition of the blood itself, and we must determine by further examination whether we have to do with a hæmic or cardiac lesion.

Cough.—It goes without saying that cough is a symptom which is apt to occur with greater or less frequency in connection with heart diseases, as so many cases are attended by passive congestion of the mucous membrane of the bronchi and air cells, and by pulmonary œdema and catarrhal processes, involving the bronchi; hence in every case attended by this symptom, the possibility of a cardiac origin should be remembered.

Recently I had a case of this kind where the intense capillary bronchitis was of such severe a nature as to threaten the life of the patient, was entirely of cardiac origin, due to dilatation and impairment of the pulmonary circulation. The necessity of recognizing the cardiac origin of this symptom is apparent when we bear in mind that unless treatment is directed toward measures for restoring the circulation, the patient may die and the cause of the trouble be entirely unrecognized.

Hæmoptysis.—This is another symptom whose cardiac origin is frequently overlooked. The same causes that produced cough and other symptoms also contribute to pulmonary hemorrhage, which may arise from a ruptured vessel, from intense congestion, or it may depend upon an embolic infraction.

Apparently, genuine pneumonic attacks are often entirely of embolic origin. Balfour is authority for this statement, "that for hæmoptysis we shall find a cardiac cause almost as frequently as any other." From what has gone before, it is easy to understand how such could be the case.

Pain.—This symptom in the cardiac region is a common event in most all diseases of the heart. It occurs also very frequently where no cardiac disease is present; thus we have a pain of neuralgic character occurring in the anæmic, debilitated, neurotic and gouty invididuals. In these cases pain is superficially located and is rather an intercostal myalgia.

In cases where the cardiac pain is associated with imperfect nutrition of the heart muscle itself, the pain becomes more permanent and severe. Then if we have a physical cause producing an obstruction of the circulation requiring an excessive power on the part of the heart to overcome the same, we have an additional strain brought to bear upon the cardiac muscle, which it resents as indicated by its painful action; hence there are comparatively few cases of heart disease in the uncompensated stage which are not attended by more or less pain, and a cessation of the same signifies restoration of compensation.

I shall not stop to speak of the pain incident to aortic aneurism, and shall refer very briefly to that due to angina pectoris. In the latter condition we have the depressing influence of pain; the most acute and severe that the human frame can experience. The heart, as it were, is seized by a mailed hand, producing that appalling agony with which is associated the sense of impending death, and may result in that event even in the first attack. In such cases there is a gradual decrease of the aortic pressure dependent upon a diminution of the heart's force, the pulse becoming enfeebled by degrees until it ceases. In cases not proving fatal, the pain ceases as suddenly as it comes on, the patient being puzzled to know what has happened, and terrified at the prospect of a recurrence.

It is beyond the province of this article to discuss the causes of this form of cardiac pain or to differentiate between the true and the so-called false angina pectoris. I may say, however, that in all probability the predisposing cause is anæmia of the cardiac plexus of general or local origin. An exciting cause directly or reflexly still further diminishes the blood supply or in some other mode influencing the cardiac nerves.

One of the most common causes affecting the nutrition of the heart muscle, as well as its nervous supply, being an atheromatous condition of the coronary arteries.

Dropsy.—An exceedingly common secondary result of cardiac disease is dropsy. This symptom is one of the earliest to show itself as result of decrease of arterial pressure or transference of intravascular pressure from the arteries to the veins. These two conditions are not exactly synonymous, for the aortic pressure may fall suddenly and fatally without the presence of any concomitant or increased intravenous pressure, but the latter is never developed without the former.

Dropsy, dependent upon heart disease, always begins across the instep, gradually filling up the lower extremities, the face and upper part of the body remaining free. But, as a dropsy of anæmia comes on in the same way, this can not be accepted as certainly indicative of a heart lesion, but must only be considered as a hint that the heart may be affected; the cardiac origin or otherwise can be determined by further examination.

When we bear in mind the frequency with which cardiac disease is complicated by anæmic conditions, and by an accompanying kidney involvement, we can appreciate to what extent, how often and in what manifold forms dropsy may occur as an accompaniment of cardiac disease, and how severe may be its results when it becomes general, or involves the lungs. These mere mechanical results adding enormously to the patient's suffering and requiring most active measures to affect relief.

It is surprising as well as gratifying to the beginner in medical practice to find how readily and rapidly dropsy, due to failure of heart compensation, may be removed by directing attention to its sourse, an enfeebled circulation.

Digestive Symptoms.—Of all the secondary phenomena connected with cardiac diseases, the symptoms due to digestive disturbances are most important, because so frequently they are supposed to be due to primary disease of the digestive organs, and so long as treatment is directed to cure without recognition of the

underlying cause, treatment will be vain. As soon, however, as the fact is recognized that the source of the trouble is a circulatory disturbance, then the application of the proper remedy will very rapidly afford relief.

The transference of intravascular pressure from the arterial to the venous side of the circulation necessarily results in diminished secretion of all the glandular organs involved in the process of digestion; the salivary, gastric, intestinal, pancreatic and hepatic secretions being diminished, there results a host of symptoms depending upon this impairment of secretion. A deficiency of bile intensifies the results of the diminished flow from the gastric glands, hence there are putrefaction, accumulation of gases, constipation, foul-smelling stools, epigastric pains, sero-mucous diarrhea, jaundice and a number of other symptoms, due to chronic catarrhal conditions of the entire gastro-intestinal canal and all of the glandular organs connected therewith. As a result of such persistent turgescence of the liver and spleen, we may have contraction of the connective tissues and subsequent destruction of the secreting cells, but this is not usually the common result in cardiac congestion; more frequently the hypertrophy is permanent.

In those very common cases where we have contracted kidneys associated with heart disease, most generally both the cardiac and kidney disease is due to the same cause, i. e., artero-sclerosis.

The rationale of jaundice in such cases should receive special mention, the congestion of the bile ducts extending into the *ductus communis choledicus,* producing complete obstruction and consequent jaundice. The skin has a greenish hue in such cases, due to combination of the congested skin with the yellow, due to bile pigment serving to produce this peculiar appearance.

It is astonishing to the uninitiated to see how rapidly all these symptoms will disappear upon the administration of sufficient doses of digitalis to overcome the obstruction of the circulation by stimulating the left ventricle to efficient contraction.

The action of the kidneys also affords a very sensitive test as to

arterial pressure. There are no organs in the body whose secretion is more rapidly influenced by the activity of the circulation than the kidneys.

The venous congestion resulting from heart disease acts mechanically upon the renal cells by facilitating the press of albuminous transudation; therefore, diminished amount of urine of normal or high specific gravity, with a small amount of albumin, is very significant of heart disease, because such condition of the urine is not found in any independent form of kidney disease of serious extent. Under the careful administration of digitalis or other heart tonics, the urine will very rapidly increase in quantity, the albumin will disappear, and what was supposed to have been a very serious renal disease will prove to have been dependent altogether upon cardiac causes.

Menorrhagia is not infrequently another result dependent upon disturbed circulation, due to cardiac weakness, and instead of treating the uterus in such cases, the trouble will be remedied by prompt attention to the central cause, namely, the heart.

The brain is another organ affected by cardiac weakness, resulting in defective aortic pressure, hence we may have sharp apoplectic or epileptiform seizures and attacks of threatened or actual syncope, tinnitus aurium, flashes of light across the field of vision, flushing of an ordinarily pale face. These are symptoms of cardiac weakness of common occurrence, especially in aortic regurgitation. Such symptoms attended usually by an apparently full and bounding pulse are often referred to cerebral congestion, treated by leeches or venesection, producing a weakening of the heart, the debilitated condition of which was the sole cause of symptoms mentioned. It is only by rectifying the central lesion, as far as possible, that we may expect to remedy the peripheral phenomena dependent upon it.

It is hardly necessary for me to say that no originality whatever is claimed for these remarks. It has been my intention only to emphasize the significance and importance of the subject. I cheerfully acknowledge my indebtedness to two works by an eminent author, viz.: Dr. Geo. Wm. Balfour, of Edinburgh, in his "Clinical

Lectures on Diseases of the Heart," and on the "Senile Heart." Both of these works have been a source of inspiration to me in practice and in the teaching of clinical medicine.

DISCUSSION.

DR. H. W. CROUSE, Victoria: There are three remedies that I should like to mention, one of which gave me marked results in the treatment of a little child three years of age, suffering with mitral regurgitation, who was sent to the coast from Denver, Colorado, to die. The child had been attacked with rheumatism several months before, and had developed a cardiac lesion, secondary to rheumatism. He had been treated with the usual remedies, the final ones being the use of digitalin and strychnia. After observing the case for a matter of a week, permitting the treatment to be carried out as outlined by his previous physician, Dr. Whitney, of Denver, I decided upon the use of tincture of nerium oleander as put up by Merck. Whittaker advises the use of this tincture in two-drop doses in a five-year-old child, three times per day. I gave it in an aqueous solution with a minute dose of nitro-glycerine. The result was that in about two weeks the intense dropsical condition had markedly improved, the gastric irritation had practically disappeared, and the impoverished systemic stage was shown to be changing through the improvement in the appearance of the hair and skin. Strychnia was used, as a tonic, in the proper doses. Compensation was allowed to take place, and the child in a few weeks was seemingly convalescent. Instead of being compelled to carry it about on a pillow and to worry with it through the night, it was sleeping regularly, with a hearty appetite, stools improved and a general condition of well-being. In order to prove that the treatment was the one which had given the benefit, not climate, I stopped the use of the nerium oleander for a week, and the faulty conditions previously existing returned rapidly. The oleander was recommenced, and the case again improved. This test was carried out two or three times. I have been convinced in handling heart cases that digitalin and digitoxin are two remedies not to be relied upon. It is difficult to state, as Merck remarks in his "Archives," when we have a specimen of the drug that is not inert. In other words, that, while prepared the same way each time, frequently an inert alkaloid will be secured in either form. The two other remedies that I wish to call your attention to are the fluid extract of cactus grandiflora and the tincture of convallaria majalis. These latter two, used in adult doses, where we have mitral regurgitation, cardiac hypertrophy, hepatic enlargement and interstitial changes in the kidneys, will give you good results; provided that you use them in an aqueous solution, ten drops of each per dose, accom-

panied by the hundredth of a grain of nitro-glycerine, given every three or four hours, at first, for a few days, lengthening out the interval gradually, then stopping for a day or two, and recommencing the drugs at the point you left off. It is essential, of course, to accompany any of these cardiac remedies with the proper hepatic stimulant. The mild chloride of mercury or hydrargyri pilulæ mass are the proper remedies. The case which I have mentioned to you permitted, through the use of nerium oleander, time for proper compensation to take place in the heart. I believe that with all of these cases diet is an essential feature; also that we should utilize the milk diet, either skimmed, buttermilk or the plain sweet milk, instead of any other food. In conditions where we have acute cardiac dilatation—practically a cardiac apoplectic condition existing—the old phlebotomy method of free bleeding will give us marked results, the cyanotic condition will be relieved, the difficult respiration will improve, and the unconsciousness will disappear. In other words, if we will but return at times to the treatment pursued by our fathers we will secure results that can not be obtained in any other way. I have called the attention of several men who have been treating cases of cardiac lesion, and have told them about the use of the nerium oleander. If you will take the "Twentieth Century Practice of Medicine," and read Whittaker upon the treatment of valvular lesions, the full data will be secured to prepare you to handle this remedy properly. All to whom I have called the attention of this remedy have been pleased with it. This preparation requires some carbolic acid to preserve it, say two drops to every three-ounce mixture. You can secure the product from Merck.

DR. FRANK PASCHAL, San Antonio: Did Dr. Crouse think of the possibility that the change from the high altitude of Denver, Colorado, to the sea level might not have influenced the condition of the heart as much as the remedy that he employed?

DR. CROUSE: I thought so at first, doctor, until I had come in contact with several other mitral cases that had developed upon the coast. In these cases I tried the nerium oleander in the proper doses, and, at the expiration of a few weeks, had secured as good results as in the first case in which I had used it. I believe by the tests that I gave tincture of nerium oleander in the first case—in other words, taking the patient off the remedy for a week and returning him to it, then testing it again, and finding that when the drug had been stopped that the case declined, and when recommend that improvement took place—proves conclusively the merit of the remedy. Fifteen cases to my knowledge have been treated by this remedy so far in Victoria, in all of which good results have been secured.

DR. W. B. COLLINS, Lovelady: I want to say that in this condition it has become a routine practice with me to employ digitalis, combined with bitartrate potash. I also employ reconstructive tonics, etc. Digitalis, in my judgment, gives as good or better results upon the heart in this condition than any other drug at our command.

DR. H. A. WEST, in closing, said: I have very little to say in closing the discussion upon this subject, except a few words in regard to the use of digitalis. In my opinion, this drug is superior to any other in cases where there is a failure of cardiac compensation. The man who understands how to use this great remedy truly has the sword of the Lord and of Gideon in his hand. With proper administration, in sufficient doses, and with a pure and fresh drug the results are sure to follow. I remember on one occasion where I consulted Dr. Janeway, of New York, upon this subject in a case in my own family, in which, of course, I was deeply interested. His statement confirmed the opinion I have just given as to the superiority of digitalis over all of its congeners. It should be borne in mind that the digitalis leaves found in many drug stores are in many instances inert. By the use of the fresh English leaves in preparing the infusion, or the prescription of Squibb's tincture or of Merck's digitalin in proper doses, you are sure to get good results. Merck's digitalin has an important place where the stomach is irritable, and can be used in much larger doses than that ordinarily laid down in the text-books. I have given this hypodermically in doses of as much as one-thirtieth of a grain, and with good results.

SPORADIC CEREBRO-SPINAL MENINGITIS.

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Epidemic cerebro-spinal meningitis and sporadic cerebro-spinal meningitis are essentially the same in pathology and symptomatology, they differing only in their etiological factors. The specific cause of the epidemic form has been found to be the diplococcus intracellularis meningitidis of Weichselbaum, while the sporadic cases are caused by different infectious agencies, viz.: streptococcus pyogenes, pneumococcus, bacillus typhosus, the micro-organism of influenza and others. Meningitis may occur independently of any of these diseases, or in the course of them or as a sequela of them. Very frequently some advance has been made in diagnosis by the examination of the cerebro-spinal fluid. In this way, some infectious organism can usually be found. Also, what appears to be a distinction of considerable importance, is the presence in all cases of multinuclear cells, and a slightly lower freezing point of the fluid.

Meningitis is very irregular in its distribution, and has many typical forms. However, the differential diagnosis from other acute infectious diseases should not be very difficult. It differs from them greatly in the severity of the nervous symptoms, which, together with continued stupor or coma, opisthotonos, slow pulse, and irregular respiration, point very clearly to the nature of the trouble. In addition to these symptoms, in most cases, there will be present high fever, rigidity of the lower extremities, contracted abdomen, and the Kernig sign.

To give a more general description of the various types, it would unnecessarily lengthen this paper; besides, I wish especially to call attention to the symptoms observed by me in four cases which

came under my observation during the past year. In each instance there was no connection or suggestion of infection. Each case occurred in widely separated localities, after several months interval between them, and under different social conditions. Of these cases, one was under a year old, two under two years, and one was five years old. The infant was bottle-fed and poorly nourished, though its surroundings were healthful. It had had previously several attacks of entero-colitis, but for a month or so prior to this its health had been very good. The attack was preceded by a mild diarrhea and slight fever lasting for three days, when suddenly the fever rose to 104° F., and a convulsion followed. After the convulsion, there was opisthotonos, and vomiting at intervals. The fever soon subsided. The child was extremely restless, and the entire body seemed to be hyperæsthetic. After twenty-four hours, the restlessness gave place to coma, and towards the last there was Cheyne-Stokes respiration. Death occurred on the fourth day.

The second and third cases were in children very strong and robust. Each had had a cold and some fever for three or four days, which resisted the usual treatment administered in such cases. The first of these, after the fourth day, had diarrhea and frequent vomiting spells. The fever became high and ran a very irregular course. On the sixth day there developed a very severe laryngitis, without the appearance of any membrane. This persisted for two days, with very great embarrassment to the respiration. During this time the child was extremely restless and peevish. The vomiting ceased, and the croup became much better, but the respiration continued to be irregular and coma soon came on. There was also contraction of the abdomen and opisthotonos. This condition lasted for seven days, when death occurred.

The second child had no diarrhea or vomiting, but after the fifth day of the coryza he had some elevation of temperature, and a slight convulsion. The fever, however, never rose above 103° F., and it usually remained about 100° to 102° F. There was also great hyperæsthesia and nervousness, constipation and retention of urine. Coma occurred on the third day after the spasm. In this case the

thermo-cautery was applied along the spine, which caused some slight amelioration in the coma. This improvement continued for twelve hours. Toward the last, the temperature fell to below normal, and the body heat had to be maintained by external applications. Opisthotonos and Cheyne-Stokes respiration were present at the last. Death occurred on the fifth day after the spasm.

The fourth case was five years old. She had always been delicate, though her surroundings were good. She had had a slow fever of a very irregular type for some two or three weeks, though the temperature was never very high. While apparently improving and without warning, twitching movements of the hands appeared, which grew more severe and more frequent between intervals. In twelve hours there was marked opisthotonos, contraction of the abdomen and the Kernig sign. The temperature was very irregular and the pulse was weak. I did not see the patient after this, but I was informed that she soon lapsed into a semi-conscious condition, and that the contraction of the arms continued. Cheyne-Stokes respiration came on at the last, and death occurred on the eighth day.

The treatment of these cases depends almost entirely upon the symptoms present, and they being so irregular, no definite course can be followed out. In a general way, opium or bromide and chloral, given by mouth or by injection, will very greatly relieve the pain and control the spasms. But in the case of infants, opium must be given very cautiously, as an overdose may itself cause coma. Undoubtedly the thermo-cautery, applied along the spine, caused a temporary relief. Nourishment, as peptonized milk and beef juice, can be given, but after coma occurs it must be given by rectal injection or by gavage. The temperature is not usually hard to control. Occasionally, stimulation in the way of whisky or strychnine will be required. Withdrawal of the cerebro-spinal fluid has been recommended, and in as much as it affords an additional means of diagnosis, it should be practiced wherever means are at hand for detecting bacteria.

In discussing this affection, I wish to call attention to the fol-

lowing suggestions: 1. In young children with colds, where the fever persists after appropriate treatment, suspicion should be aroused as to the possibility of meningeal infection. It was suggested by one of my colleagues that such cases were influenza, and that the cause of the meningitis was the direct infection of the meninges of the influenza bacillus. 2. The desirability of bacterial diagnostic methods being more generally used by the general practitioner. In such cases as I have cited, for instance, if it were possible to know the real etiological factors, a more rational treatment might be prescribed. 3. The distinction must be made between the epidemic or contagious form and the sporadic or non-contagious form. This is important, for protection should be given the public from the former, and the non-contagiousness of the latter should be fully explained for the good of the patient, and to relieve the public anxiety. The public generally look upon this disease as being very contagious, and the burial regulations affecting it in many places are very rigid and fail to make this important distinction.

PNEUMONIA.

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Pneumonia was recognized by Hippocrates and Galen in the early days of medicine, but was confounded with pleurisy to such an extent that the rusty sputa characterizing the former disease was described as an attribute of the latter, and pleurisy was said to be capable of producing cavities in the lung.

We will define pneumonia as a disease whose essential anatomical feature consists in the inflammation of the vesicular structure of the lung, which is thereby rendered impervious to air through the accumulation of the interim of the alveoli of the products of such inflammation. Clinically, it is characterized by pyrexia, which, in the majority of cases, when the disease is primary, commencs with rigors, or chills; it is also attended commonly by pain in the side, by dyspones; cough; sanguinolent; sputa, and great physical prostration.

We approach this subject with a degree of caution, and must admit that all we know positively about the nature of pneumonia is that it is anatomically an inflammation of the air vesicles and bronchioles. When we go beyond this fact and attempt to determine its cause, we leave the confines of positive knowledge and enter the illimitable realms of conjecture, or the more or less obscure nebula which surrounds the body of exact science, and is yet unincorporated.

To be sure the revelations of recent years along the lines of bacterial pathology lend a new interest to this subject, and very promptly suggest a reconsideration of the origin of the inflammatory lesion in pneumonia. Klebs, in 1877, created a great amount of enthusiasm when he declared he had found the key which was to unlock this particular pathological mystery. Eberth, in 1881,

gave us more details along the same line. Koch, Freidland, Leyden and others have gone over the trail, each adding their mite to the theory advanced by Klebs.

Sternberg, by carefully conducted experiments, showed that pneumococci were to be found in the normal human saliva; and as has proven the case with the germ theory in other instances, we must search for some other cause to explain its occasional virulence. Dr. Jacobi has denied *in toto* that pneumonia *must* necessarily be a bacteric process.

For me to give a complete description of a disease like pneumonia, I would take up much time that properly belongs to others, for it is not possible to do so within the limits of a paper like this. I look on pneumonia as a self-limited disease; but should be helped over the severe places by the skilled physician. He should conserve the strength; guard carefully the heart, and by every possible means endeavor to diminish the toxins.

Pneumonia generally begins in the lower portion of the lung (not the bottom), but below the upper half and spreads both ways; it may occupy one lobe only, or it may pass the septum and occupy a second lobe, or it may invade the whole lung. The right lung is most frequently involved; the ratio being, perhaps, about 1 to 3. The disease is more prevalent among males than females, and it appears that those between the ages of 36 and 40 are more susceptible to the malady. The months of December, January and March are apparently most favorable for the development of the disease, with May and June next in order. While it occurs at all seasons of the year, it is most certainly more common in the colder months. It behooves the physician to be on guard when it comes to pronouncing pneumonia of a special type, unless he has experience back of his opinion. An examination, a thorough one at that, both as regards objective and subjective symptoms, must be made, for remember that no sharp line exists between the ending of a severe bronchitis and the beginning of capillary or catarrhal pneumonia. Depend always on a physical examination as being of

the most importance. Children as a rule, under six years of age, have capillary or catarrhal pneumonia—from six to sixteen it is generally croupous, whilst with the adult is it usually lobar. I have already defined pneumonia, and now will give you, in brief, the symptoms. There are a few points that perhaps I may bring out in this paper that are not common (?) with the standard text-books; I am familiar with them and know they are correct; for that reason I will not apologize for my position.

One of the first physical signs in pneumonia is a fine crepitation, the same that is found in the smaller bronchial tubes in bronchitis. Now, understand me, at this point I can not, neither can you at this stage, make a distinction between bronchitis and pneumonia. Some of you may dispute this point with me, but that will not change my opinion in the least. The physical signs are not distinct enough for me to be positive, so I will use caution; the process of filling the air cells is steadily going on, and will continue for a day, or perhaps a day and a half; and during this time until the cell is filled (at which time the air is excluded entirely) you will continue to have this crepitation; you will get this crepitation only on inspiration, and you may have to tell your patient to cough and then listen to the inspiration before the cough, which will be a deep one. Now, you will understand that after the cell is filled with fibrinous material, no more air can enter; therefore, no more crepitation, unless we have an accompanying bronchitis; but you get another sound—a breath sound, and also a voice sound. If any of you have ever heard Dr. Loomis, or Dr. Stephen S. Burt, of New York, lecture on physical diagnosis, you will recall their description of those sounds, and their importance—their descriptions were identical, for Burt was a student of Professor Loomis. Both of these sounds are readily detected. Two things now must be borne in mind, for an opinion is being given—perhaps to a circle of anxious friends. The crepitant rale in pneumonia and the crepitant rale in bronchitis may mislead, and give a very uneven road to make the return trip over, for sometimes these return trips are not at all pleasant. Quite often I have made my return from impor-

tant cases of this sort and found the traditional maiden with her song and tambourine conspicuous by her absence. But if one is guided by this one rule, he may consider himself reasonably safe. The crepitant rale in pneumonia occurs only in one lung, at first at any rate, for should we have double pneumonia, it will not begin in both lungs at the same time. If double, it will develop in one lung a day or two before it occurs in the other. The crepitant rale in bronchitis is *always double*. There is resonance on percussion in bronchitis, *but no dullness*. A cough is not only almost constant, but it is generally one of the earliest symptoms, and among the aged bronchitis commonly precedes pneumonia. The respiration in pneumonia is always out of harmony with the pulse rate. Often a patient will present the symptoms of an engorged lung; sluggish brain; dull intellect, etc., with a pulse rate of less than 100, and a respiration of 50 or 60, or more per minute, and exceedingly shallow. Sputa is generally an early symptom, but not always—cases occur where there is little or none until the disease is well advanced. When the disease is in the apex of the lung, expectoration is scant compared to that at the base of the organ. Children under six years of age rarely expectorate, and with the adult it often ceases when approaching a fatal termination.

The circulatory system must receive direct attention, for I have not what is commonly called a weak heart, but an *engorged* heart; and when the pulse rate steadily advances with the disease, it bodes no good, especially if it reaches 130 or upward in the adult. A high rate, 140 or 160, with children is not so dangerous, but it means much with the patient who has reached the adult age.

The mortality in pneumonia is much gerater some years than in others. Why, I am not prepared to say. The mortality for the State of New York, during the year 1878 I believe, was one death out of every fourteen from all other causes; and these figures will hold good generally for nearly all New England.

It is the opinion of the writer, though I may not be able to prove it at present, that atmospheric influences cause a catarrhal hyperæmia of the bronchial mucous membranes that is preparatory

for the poison of pneumonia, and that there is no pneumonia without this preparatory condition. Pneumonia is not due to weather influences alone, but they have a decided influence in the origination of the disease.

TREATMENT.

In mild, uncomplicated cases, I do but very little. I let the patient alone as far as possible; conserve the strength; guard the heart and endeavor to hold the temperature within the bounds of reason; try to make the patient as comfortable as possible; see that the room is well ventilated, so that the patient can get an abundance of pure, fresh air. In order to keep the air as pure and free from contamination as far as possible, see that the number of attendants are as few as possible; endeavor to keep the temperature as uniform as possible—about 70 degrees; give the patient plenty of pure cold water, which serves to quench the thirst, flush out the organs of elimination, and reduce temperature. A calomel purge in the beginning of the disease, followed by a saline, if necessary. If there is much pain or the patient is restless or suffering from sick stomach, I usually give morphine hypodermically.

In the great majority of cases, the above is about all I give. I meet with cases, however, where the treatment is not so simple: For instance, a patient previously strong and robust is suddenly attacked with the disease and attended with high fever. I find a strong, full and bounding pulse, with rapid breathing, may be attended with wild delirium. In this type of the disease, I have found nothing better than Norwood's Tincture Veratrum Viride. I give the drug for its effect, which is shown by a reduction of the pulse rate and respirations. Veratrum acts as nothing else in this world will; it relaxes and produces dilatation of the entire arterial system, and in this way favors the easy flow of blood into the dilated blood vessels, and in a great measure relieves the engorgement of the lung tissue and heart, and frees the latter of a great portion of its burden. Veratrum not only accomplishes this most happy result, but it reduces the fever. I have used veratrum hun-

dreds of times since I began the practice of medicine, and I have never had the drug to disappoint me in a single instance. I have never seen any dangerous symptoms attending its use. I have used ice locally to great advantage in this class of cases. Cough syrups I rarely ever use, because in my opinion, by upsetting the stomach, they do quite as much harm as good; also the different preparations of ammonia.

Stimulants are required in most cases, I think, but should not be given too early in the disease. If the pulse is weak and fast—the patient approaching the danger line—stimulants should be given, but the kind of a stimulant is a matter of choice with every physician. Some excellent authorities claim digitalis to be almost a specific in the treatment of pneumonia. I believe the drug is used by the majority of physicians everywhere, but in my opinion this drug is responsible for a great amount of harm. I used the drug for many years in the treatment of pneumonia, and I watched its effects closely, and to me it has been a bitter disappointment. Digitalis is a powerful heart stimulant, no one will deny, but while it stimulates the heart to more vigorous action it also, through stimulation of the vaso-motor ganglia in the medulla, causes contraction of all the arterioles throughout the body. It is known that the heart bears the brunt in pneumonia. The obstruction in the lung tissue vastly increases the labor of the heart, and if it be true that digitalis or any other drug diminishes the caliber of the blood vessels, is it not reasonable and plain that it increases the resistance which the heart has to overcome to pump the blood through them? You do not want to whip an overloaded horse; the thing to do is to take part of the load off.

Now, in cases like the above, with rapid breathing, great cyanosis, and rapidly failing heart, one has a condition of great danger and unless the heart can be relieved of some of its burden, soon a cessation of the play of its valves and the rhythm of its throb will inform us that the wheels of life have stood still. It is not the motive power that is at fault altogether, but the hindrance which the blood finds in circulating through the capillaries. The proper

thing to do is to administer remedies that will have a tendency to dilate the arteries and favor the onward flow of the blood. Is there such a remedy? Nitro-glycerine will do it, but its action is too evanescent, and the drug can not be repeated as often as necessary. Alcoholic stimulants, in my opinion, answer the purpose better than any other remedy. I give them for the effect and not with a sparing hand. Alcohol is especially valuable with old people, and children stand it remarkably well. Alcohol undoubtedly has, to some extent, an antidotal effect in all septic cases, and, no doubt, in my mind, does great good in pneumonia in this way. Strychnine is a good heart stimulant in pneumonia, provided it has not been used too long before the danger point. I have used carbonate of creosote in some cases, but I can not say that is has cut the disease short in any single instance.

I watch the stomach carefully; keep the mouth and teeth clean, and see that the patient gets plenty of sleep. Sulfonal is an excellent remedy to produce sleep in pneumonia. I believe we frequently over-feed in pneumonia. A surplus of food often serves to produce flatulency and diarrhea. I am partial to buttermilk, where it is liked and agrees with the patient. Beef juice is fine when properly made. I like Ducrow's Elixir very much as a food in pneumonia. I think the proper thing to do is to let the patient alone as far as possible, and treat everyone on the expectant plan.

DISCUSSION.

DR. F. D. GARRETT, Gainesville: One point I want to make: the doctor, in speaking of the differential diagnosis between pneumonia and acute bronchitis, says: "I do not think any one would be able to distinguish a case of acute bronchitis from beginning lobar pneumonia." I believe it is possible to make a distinction between the two. Acute bronchitis involves the bronchial tubes of both lungs; lobar pneumonia is different, it is confined to one or more lobes.

DR. S. C. RED, Houston: I have seen a good deal of pneumonia; I have written about it; I read a paper, you doubtless recall, on Pneumonia, at the last meeting. How the doctor is able now, in the light of present knowledge on bacteria, to say that the etiology of pneumonia is shrouded

in mystery is beyond my ken. It seems that the pneumococcus, in a large majority of cases, is responsible for pneumonia; that there are other organisms that will produce the same results is certain, but that pneumonia is decidedly a germ disease is settled.

In regard to the use of the various drugs for the stimulation of the heart, it occurs to me that it is absolutely unnecessary, and is often contraindicated until there is evidence shown that the pulmonic second sound of the heart is discovered to be losing in its strength or volume; unless this arises, the use of cardiac stimulation should be left off.

At the last meeting I read a paper and spoke of the use of creosote. It was just then beginning to be extensively used. Since then I have seen a good many cases of pneumonia, especially of the croupous variety. In a large per cent of them, i. e., in a number of the cases, I did not use creosote. When I found, however, that those cases were not doing well I put them on creosote, and they immediately began to improve. This did not occur in one, two, three or four cases; but it occurred in dozens of cases, and in every instance there was an improvement in many of the symptoms. Some of my cases died. This negatives creosote as a specific, yet places it very near being one. By what means it accomplishes this result I am unable to say.

DR. T. P. WEAVER, De Leon: The doctors who have gone before me misunderstood the doctor who read the paper. I am sure he did not say absolutely that he did not believe that the disease was influenced or caused by the pneumococcus; but, because of the fact that the pneumococcus is frequently found in normal sputum, and that on microscopical examination we frequently find other germs in the broken down tissue of the lungs, he meant that it was possible that there might be some other agent. Suppose you have a specimen and find the staphylococcus or the streptococcus in it, is it right to say that it was the cause of the disease or the agent producing it? The consensus of opinion is that it is not, but secondary to the ravages of the pneumococcus. As to giving tr. veratrum in pneumonia, I give it in the beginning, or inflammatory stage, especially in full bounding pulse.

Now, I want to say that this subject has a great interest to me, as I live where we have a great deal of the various forms of pneumonia, and I say, fortunately for the people, that it is less fatal in our part of the State, in my judgment, than in some other localities, for the reason that we have very little malaria. As stated above, in the inflammatory or beginning stage of pneumonia we use veratrum; we do not know just exactly what it does, it is all a good deal of theorizing; but we believe it lowers blood pressure in the inflamed areas. We do not use veratrum as the heart gets

weak; then we should leave off veratrum and give the patient rest. As to digitalis, strychnia and whisky, I believe that in the latter stages I would give them, because I believe that in heart weakness we have got to hold it up; but I do not believe in giving heart stimulants at all until the heart needs them.

DR. M. M. SMITH, Austin: One point I should like to make. It is the experience of some of the physicians who live in malarial sections of the country, and I have noticed that in the highly acute and epidemic form of pneumonia in Texas that invariably my serious cases, with very few exceptions, existed wholly among patients who were saturated with malaria or who had previously had malarial fever. It has occurred to me that there must be something with reference to the malaria that causes a more unfavorable prognosis in a case of pneumonia. Doubtless some of the members here, and particularly Mr. Moore, are familiar with that phase of the question. I merely introduce it to get the expression from this Association.

DR. FRANK PASCHAL, San Antonio: I wish to say that it does not require an experience of twenty-five or thirty years to make one aware of the fact that pneumonia can not be treated by this or that method. You can not treat any disease in that way. You treat the case. You have to use common sense in the treatment of this disease, as you do in everything else. In regard to the use of stimulants, I do not think they are always indicated. The disease at different times will manifest peculiar conditions. For instance: during a practive of nineteen years in a district of over 4000 feet above the sea level, and entirely free from malaria, there were some years in which pneumonia was very benign; then again, during other years, pneumonia would be virulent, asthenic, and from the beginning one would have to employ stimulants, so one can not employ the same treatment in all cases of this disease. My experience has been that when properly treated, the mortality from pneumonia should be small. I have seen doctors keep their patients on the flat of their backs for weeks at a time, and never have them turned on their sides; you are bound in this way to get hypostatic pneumonia. I always instruct the nurses to keep their patients off their backs as much as possible. Proper nourishment with common-sense treatment must apply to this as to all other acute diseases.

[The following remarks upon the treatment of croupous pneumonia were made at a meeting of the West Texas Medical Association at San Antonio, October 23, 1902, and subsequently published in the January, 1903, number of *Merck's Archives*. As this is essentially what I intended to say in discussing the paper of Dr. Evans—and the subject is one of such great importance and practical interest to my friends, the members of the Association

—I may be excused for presenting the same for publication in the proceedings, especially as I was prevented from completing my discussion at the time.]

DR. H. A. WEST, Galveston: Having had the opportunity of participating in a discussion on croupous pneumonia before the Section on General Medicine of the American Medical Association, at Saratoga last June, I was impressed with the fact that there were various questions in regard to this disease which were very far from settlement, in spite of the immense progress made in the past few decades in the knowledge of the natural history, pathology and therapeutics of pneumonia. Illustrative of such questions the following may be mentioned:

(a) Has a better knowledge of the disease and a more rational treatment resulted in any decided decrease in mortality?

(b) What, if any, satisfactory explanation may be given of the high mortality which continues to prevail?

(c) Is there any specific treatment?

(d) Has the use of anti-pneumococcus serum yielded satisfactory results?

(e) Are the coal tar antipyretics contra-indicated?

(f) What measures, if any, are justifiable for the control of temperature?

(g) Are opiates contraindicated?

(h) Under what circumstances are cardiac stimulants required?

(i) Are the enormous doses of digitalis, as used by Petrusco and his followers, rational and justifiable?

(j) Are blisters and counter-irritants indicated?

(k) Should poultices and other hot applications be used?

This is by no means a complete list of such questions, but will afford a text for the present unpretentious discussion.

Has a more rational therapy, based upon a more thorough understanding of croupous pneumonia, resulted in any decided decreased mortality? Such a question would hardly be necessary if the figures in the mortuary reports did not appear to give a negative reply. Those who listened to the discussion at Saratoga, or who have read Dr. Osler's views upon this subject, can not fail to have been impressed with their pessimistic tendency. In fact, he regards the treatment of the disease under consideration as a matter of professional opprobrium. I do not altogether take this view. In spite of what the figures of the mortuary reports may indicate, it does not appear to me as reasonable that the Sangrado method of purging, puking, blistering and bleeding, which was the practice of our forebears, in a disease where the tendency to death was from cardiac depression, did not turn the scale against the patient in a great many instances. Who can call to

mind the barbarisms of the antiphlogistic plan of treatment without a shudder and without thanking the Lord he was not a patient in those days? The enormous doses of calomel, the excessive purgation, the salivation, the poisoning with tartar emetic, the excessive nausea, the irritation from large blisters, the exhaustion from excessive blood letting! How any of these patients recovered excites our wonder and admiration for a constitution that could withstand such heroic treatment.

I must conclude that the rational symptomatic treatment of the present time will produce better results in spite of what the figures seem to teach. In other words, there must be something wrong with statistics which would convey a lesson so irrational. The mortality rate of croupous pneumonia varies under many different circumstances, entirely irrespective of the treatment. It will in the future, as in the past, occupy a foremost place as a cause of death. It is the terminal event and complicating factor in many other morbid processes, *e. g.*, in acute infections, such as cerebro-spinal meningitis, malarial, enteric, typhus and relapsing fevers, epidemic influenza, measles, scarlet fever, dysentery, pleurisy, pericarditis, malignant endocarditis. It is a very common cause of death in alcoholism, old age, tuberculosis, chronic Bright's disease, arteriosclerosis and in many other conditions where vitality is impaired and the resisting powers of the individual diminished in consequence of exposure, want, uncleanliness, overcrowding and unhygienic surroundings. The pneumococcus is a frequent inhabitant of the mouth, occurring there in the virulent state in 15 to 20 per cent of healthy adults; and on account of the anatomical relations of the lungs and the frequency with which a germ-laden atmosphere is inhaled, infection and inflammation of them is of frequent occurrence; and there is no wonder that croupous pneumonia should furnish 7 per cent of the entire mortality. A disease so widespread in its prevalence will attack many persons with lowered resisting powers as a result of pre-existing acute or chronic disease, and consequently will always be attended by a heavy mortality rate in spite of the best and most rational therapeutic measures.

Now, as to the question of specific treatment. Is any method of treatment known by which this disease may be aborted, or its duration shortened? The only reply I can give to this question is in the negative. Venesection, mercurialization, tartar emetic and blisters may be dismissed with a word: "Tried and found wanting," and the same may be said, in my opinion, of quinine, veratrum viride, aconite, digitalis, creosote and the anti-pneumococcus serum. Osler says: "Pneumonia is a self-limited disease which can neither be aborted nor cut short by any measures at our command. There is no specific for it." The facts in sppport of this position are so numerous and have been so often repeated that it is unnecessary for me to recapitulate them here.

The same reply may be made to Cassoute and Corgier, with regard to the treatment by creosote carbonate, as to Aufrecht in his advocacy of quinine: that the period of observation is too short and the number of cases thus far reported too small to afford a basis for any positive opinion as to results. I do not intend to convey the impression that these remedies are not useful, but only that the claims made as to their specific effects are as yet unproved.

When we take into consideration that the pathological process is already established in the lungs at the outset of the initial chill, and the absence of evidence to show that we have any agent capable of destroying the specific micro-organism of the disease in doses which would not be toxic to the individual; and, further, that with the exception of malaria, diphtheria, syphilis and possibly acute rheumatism, all other diseases of an infectious nature are self-limited, we are certainly justified in our skepticism as to the specific effect of any drug in the abortion of pneumonia. The statistical evidence which would seem to establish the specific effect of any special drug, should be considered with regard to the extreme variations in the mortality rate, entirely independent of treatment. For example, in selected cases as furnished by strong and previously healthy adults, as in the army in time of peace, the mortality may not exceed 3½ per cent, the rate in private practice under some conditions may approach 7 per cent; while in hospital practice—taking its patients from all walks of life, the alcoholic, the aged, and those with impaired vitality from a multitude of causes—the average rate is about 25 per cent. In unsanitary camps, in besieged towns, in prisons, in malarial districts, and under a variety of other unhygienic conditions, irrespective of the most enlightened treatment the rate may be much greater.

As regards treatment by the anti-pneumococcus serum, Dr. James C. Wilson, of Philadelphia, treated thirty-six cases in the German Hospital with a mortality of 28 per cent. Dr. Tyler, of Denver, out of one hundred and sixty-two cases lost 16 per cent. The consensus of opinion seems to be that the serum treatment is unsatisfactory.

So far as the coal tar antipyretics in pneumonia are concerned, in my opinion they should be mentioned only to be condemned. This is contrary to the teachings of some excellent authorities, and to the practice of many. The tendency to death in croupous pneumonia is from cardiac failure due to the action of the pneumo-toxin upon the nerve centers controlling the circulation, and mechanically from the obstructive effects of the pulmonary exudation—overburdening and overdistention of the right ventricle.

Von Jaksch has suggested that in the absence of leucocytosis in severe pneumonia that antipyrine, acetanilid, pilocarpine and neuclein might be useful by increasing the number of leucocytes in the blood. This theoreti-

cal claim is the only one, so far as I know, ascribing curative powers to these agents. The most that is usually claimed for them is that they act as palliatives: reducing temperature, promoting diaphoresis, relieving pain, and quieting nervous distress. But the cardiac depression with which the result is accompanied is too positive and serious an evil to be gainsaid, hence my conclusion that the wise physician looking to the recovery of his patient as the chief object to be obtained will avoid these agents.

As to the cognate question, what measures are justifiable for the control of fever, it is contended by some very able authorities that the fever itself is a conservative process, and should be allowed to take its course. There are extremists, on the other hand, who contend that treatment for the fever is treatment for the disease itself, and who resort to the same active means for reducing temperature as in typhoid fever. The conservative physician, while recognizing the value of hydrotherapy, will avoid such active measures as repeated ice poultices to the chest and the cold plunge baths. When the temperature reaches over 103 degrees, cool sponging and applications of cloths to the chest wet in water at a temperature of 80 to 90 degrees are useful. When there are headache and delirium, the ice cap and a bath at 90 to 100 degrees F. are usually sufficient. With embarrassed respiration and failing heart, a warm plunge for two to three minutes at 103 to 105 degrees will often have an excellent effect.

In regard to the use of opiates, many cases will get along without opium. In children we should be especially careful in its administration. I can say of opium in croupous pneumonia what has been said of its use in dysentery: "It has been abused by those who use it, and used by those who abuse it," which is intended to express that opium is indicated in some cases, in some form, or at some time, in spite of the serious objections which have been urged against it. It goes without saying that there are many cases where it is not required; and there are other cases, especially in children, where it should be used with great care or may be positively contra-indicated; but in those cases attended by marked pleuritic symptoms—the stitch in the side, severe pain, impaired respirations and shock—there is no agent known to me which will take the place of opium.

It may be given as morphine, hypodermically, in ¼-grn. doses with 1-100 grn. of atropine; or in the form of Dover's powder, 5 to 10-grn. doses every three or four hours; or as morphine with tablespoon doses of liquor ammoniæ acetatis at about the same intervals. In addition to its analgesic effects, there is probably no agent known superior to morphine for the control of excessive cough. I have tried heroin in doses of 1-12 grn. and codeine in ¼ to ½-grn. doses as substitutes; but in my opinion morphine is far superior to anything else in the irritative painful cough of pneumonia.

Of course, it should be discontinued as soon as the symptoms for which it has been prescribed have yielded.

Coming now to speak of cardiac stimulants, these agents, it is now universally recognized, occupy the foremost place in the treatment of pneumonia. The tendency to death being from heart failure, the most important indication is to sustain the heart until the crisis shall have passed. I do not wish to convey the idea that heart stimulants are required in all cases of croupous pneumonia. Many cases will get well without the use of these agents, but in the presence of asthenic conditions and heart weakness, alcohol, strychnine, caffeine, camphor, musk, digitalis, sparteine, ether and strophanthus, occupy a most important place.

Alcohol and strychnine stand at the head of the list, and may be used with a free hand. Unquestionably many cases have been saved by using large doses of these remedies. They should be prescribed for their effects, regardless of the ordinary doses: strychnine in 1-30 to 1-12 grn. doses hypodermically every three or four hours; alcohol in the form of good whisky or brandy, as much sometimes as a pint or quart in the twenty-four hours, as may be demanded. As regards digitalis and its congeners, I do not think that the enormous doses recommended by Petrusco and his followers will stand the test of clinical experience. While they may stimulate the flagging ventricles, they increase resistance of the arteries; and hence if used at all should be given in moderate doses, and their possible evil effects modified by combination with arterio-dilators, nitro-glycerine, amyl nitrite or erythrol tetranitrate. These latter agents are extremely valuable by dilating arteries; enabling us, as it were, to bleed the patient into his own arteries, and thus relieve the overdistended right ventricle. The erythrol tetranitrate may be given in doses of ½ grn. every four to six hours, and is said to be much superior to other agents of this class on account of its more sustained effects.

Speaking now of counter-irritants, it is hardly necessary to say that the enormous blisters formerly used do more harm than good, and should be forbidden. In some instances small fly blisters or dry cups are advantageous for the relief of pain. The same may be said of the turpentine stupes, applied occasionally as may be required.

As to poultices and jackets, it has only been a few years since nearly all the systematic writers recommended these applications; but, in my opinion, they are to a great extent contraindicated, especially where the respiratory powers are very much impaired, as in double pneumonia, in asthenic cases and in children. Here the mechanical effects of heavy poultices bound around the thorax can not fail to be harmful by interference with respiration and the comfort of the patient. Occasionally the application of cold

or hot cloths to the chest may aid in relieving pain and reducing temperature; otherwise they should be discarded.

Certain general measures of treatment are of very great importance. The value of admitting an abundance of fresh air to the bedroom of the patient can hardly be over-estimated. A physician in many instances has to use his authority to secure open doors and windows, against the ignorant prejudice of attendants; he should bear in mind that the life of the patient may depend upon ventilation alone.

Diet.—In a disease where asthenic conditions prevail, the nutrition of the patient is of the utmost importance. Bearing this in mind, and the further fact that there is serious impairment of the digestive and assimilative powers, the physician should strive to arrive at a happy medium by the judicious regulation of the diet, avoiding overfeeding, yet maintaining the patient's strength by a sufficiency of easily digested liquid food. There are many cases where it is necessary to employ tact and a knowledge of dietetics in order to secure this result. Especially this is the case when nausea or vomiting are prominent symptoms. Under such circumstances it may be necessary to resort to temporary feeding by the rectum.

The Bowels.—It is necessary to secure a sufficient intestinal evacuation and is often expedient in malarial countries to begin the treatment by a moderate dose of calomel, say 4 to 5 grains, given in divided doses. Small doses of this remedy are frequently of service also during the progress of the case—where a coated tongue, nausea and constipation indicate imperfect elimination and impaired assimilation.

Quinine.—In cases complicated by malaria, and all cases occurring in malarial districts, quinine is required. It should be used in sufficient doses to overcome this complication. At the same time, the depressing effect and tendency to produce nausea and interference with the patient's nutrition should be avoided by proper dosages and combination.

Creosote and Its Congeners, Guaiacol Carbonate and Thiocol.—The remarkable results claimed for these remedies in the treatment of croupous pneumonia, first by Corgier and Cassoute, and subsequently by numerous followers,, demand investigation. From statements previously made, it will be understood that I can not subscribe to Van Zandt's conclusions that these agents are capable of cutting short the disease; but that by the exercise of antipyretic, antiseptic and tonic powers these remedies may mitigate and control certain cardinal symptoms, I am not prepared to deny.

Thiocol (guaiacol-sulphonate of potassium), it is claimed, possesses certain decided advantages over any other preparation of guaiacol or of creosote: it is soluble in water, free from odor and taste of guaiacol or of creosote, is non-toxic, non-irritating, and exceedingly assimilable. It may be

administered to adults in doses of 5 to 20 grn. three times daily, in a powder, tablet or solution, in syrup of orange or syrup of cinnamon.

Intravenous or *suboutaneous injections of saline solutions*, it is claimed by some, are of decided value. A small preliminary *bleeding* is held to be useful. *Oxygen* inhalations should be combined with this treatment. The modus operandi of saline transfusion is dilution of toxins, increased elimination, reduction of temperature, and stimulation of cardiac and respiratory functions.

In a discussion which followed the reading of this paper before the West Texas Medical Association at San Antonio, I requested an explanation of the fearful mortality resulting from croupous pneumonia during last winter and spring in certain portions of Texas, which has been variously estimated as from 50 to 75 per cent. Two opinions were given. One was that it was due to malarial complications; the other, offered by Dr. Frank Paschal, was that for inexplicable reasons nearly every case of pneumonia was characterized by profound asthenia during certain seasons, for which malaria was in no way responsible.

The following facts were also brought out in the discussion: That the mortality was far greater in the negro race than in the white; that during the recent war in South Africa, owing to the unhygienic conditions, croupous pneumonia was an exceedingly frequent cause of death, and was attended by an excessive mortality rate.

DR. C. E. CANTRELL, Greenville: In answer to Dr. Smith with reference to patients that have pneumonia and have had malaria previously, I want to say that I have had considerable experience along that line in treating pneumonia. I have found that patients who have had malaria in the summer are more susceptible to pneumonia. Take a man who has had thirty or forty chills, and if he gets pneumonia he is liable to die in spite of all you can do; he generally has acute lobar pneumonia. If you treat a case that has had chills, he has not the blood supply to hold him up, and you had better be more careful than if he had not had the chills.

DR. J. T. O'BARR, Ledbetter: In regard to giving quinine, I do believe that it is good before expectoration comes on—during the congestive or the stage of engorgement a few large doses of quinine do good.

DR. J. H. MCCRACKEN, Mineral Wells: For acute cold I have ever found quinine beneficial; but I can not recommend its use in pneumonia, if for no other reason than the fact that it excites the nervous system, thereby making the patient nervous and restless and increasing the danger of brain complication. I think you will find that doctors who use quinine and opiates in the treatment of pneumonia get the worst results; however, an occasional dose of opium to produce rest is good practice. In malarial

complications quinine should be given. I agree with Dr. Paschal, that every case is a law unto itself, but I believe the routine practice of giving quinine and opium should be condemned.

DR. BETHEL NOWLIN, Jonah: I believe I can tell you how to treat pneumonia in a few words. I have a treatment of my own for pneumonia (and I have a very high opinion of my judgment in the management of this disease). Put the patient to bed at the earliest possible time, in a good comfortable bed, and in a good, warm, well-ventilated room; open bowels with some mild purgative; keep him quiet, but let him rest. Feed him a light liquid diet; give him what water he wants. That we can not abort pneumonia is generally conceded; it is a self-limited disease. Give him comfort and support him, and keep drugs out of his stomach, and he has the best chance to get well. I am strongly opposed to putting ice on pneumonia patients to control high temperature. Last winter a year ago there was appalling mortality in Texas from pneumonia, and I believe if the treatment was known, the large majority would be found having died with the ice bag on their chest.

DR. J. T. ORR, Terrell: The truth is we do not know anything about pneumonia; everybody has a different treatment, and the proof that one remedy is to be preferred and is specific has not lessened the death rate any. A great deal has been written as to aborting pneumonia. A few months ago I was taken with a rigor in the afternoon, followed by high temperature, with a very rapid pulse and rather painful cough, followed immediately by rust-colored sputum, expectoration free, pupil dilated, nausea, restless expression on face. I took an eighth of a grain of morphine and sent for my colleague and he said that I would be several days in bed with pneumonia; that there was considerable dullness over the entire lower portion of the right lung. About one o'clock I had a profuse perspiration, no rusty expectoration, and the next morning I was entirely well. Was it a case of pneumonia aborted?

DR. JAMES H. EVANS, Palestine, in closing, said: I think the gentlemen who have spoken misunderstood me to a certain extent—that the disease is due to the pneumococcus; that is the concensus of opinion. No matter what you do we will have epidemics and our patients will die. What to give and what not to give is what I dwell on mostly. I believe we lose sight of the great good to be derived from the older remedies. Pioneer physicians got along with veratrum all right, and I do not believe that we possess a better drug than veratrum for pneumonia today. I do not give it in every case of pneumonia; in the strong and robust and in the sthenic stage only. Suppose you have a case with a full bounding pulse, temperature running up to 104 or 105, and oftentimes attended with delirium; in

this form there is nothing better than veratrum. As to digitalis, it is a heart stimulant, no one will doubt; but I believe that it contracts the arterioles and throws more work on the heart—it may be compared to a tired horse. I claim that in congestion of the lungs, as in pneumonia, digitalis is contraindicated. Alcohol, I believe, is the best remedy we possess; we know that it does not contract the arterioles, it stimulates the heart and dilates the blood-vessels. I believe we do more harm than good in the treatment of pneumonia. If we will only treat the patient and not the disease we will get the best results in pneumonia. As to the diagnosis, one gentleman claimed that he could distinguish between bronchitis and catarrhal pneumonia. We first have a bronchitis preceding pneumonia. Capillary bronchitis and catarrhal pneumonia are identical. I claim we can not tell when one is just merging into the other.

SOME OBSERVATIONS ON THE TREATMENT OF PULMONARY PHTHISIS IN PRIVATE PRACTICE.

H. J. CHAPMAN, M. D.,

SAN ANTONIO, TEXAS.

The problem that confronts one in the treatment of these cases in private practice is a somewhat different one than the care of same in sanatoria. With my increase of experience, I am the more impressed with the great necessity of a complete supervision of habits without which many, if not most, cases will not do well, no matter what treatment is used or to what climate they are sent. Speaking broadly, all cases that show a temperature of over 100 degrees should be kept at rest at least during the hours of fever, and better still, one hour before the expected rise. The old advice to live out of doors and take all the exercise possible has been vastly overdone, and too often literally followed. An out-of-door life is one of the great essestials, but it should be so regulated as not to exhaust the patient in his search for sunshine and fresh air.

Each case must be separately studied; the amount and kind of exercise prescribed, bearing in mind the strength of the individual, his previous habits, his fever, and the effect of exercise on the heart.

An old rule that I am apt to give patients is this: Do not do anything that exhausts you or causes shortness of breath.

Another problem, that is hard to solve, constantly presents itself. That is the matter of diet. It is easy to tell your patients to eat all the easily digested and nutritious food possible, but that is not sufficient. One must individualize and study the needs of each patient and ascertain if directions are intelligently followed; guarding against the errors of stuffing on the one hand, and lack of good food on the other. Forced feeding is often of great value.

but must have the supervision of the physician, or the digestive organs will rebel, and we will lose more than we have gained.

Ventilation is another item that demands attention. Most lung patients are especially afraid of fresh air, and have to be strictly instructed to be in the open during every hour of daylight, and in this climate should accustom themselves to sleep on porches, or at least in rooms with every window open.

Climate is a most valuable adjunct, but it has been demonstrated many times that a large per cent of early-stage cases will recover if placed under hygienic conditions, and made to live rightly. The results in some of the sanatoria located within a few miles of some of the large cities afford ample proof of this assertion. And right here I wish to call attention to one fact, which, while hardly germane to the subject, is of great importance, and that is the educational value of sanatoria. This is not confied to the patients themselves, but makes its influence felt from many centers by means of the recovered cases. Germany is foremost in this movement, and has proved that it is much more economical to the State to assist in the recovery of early cases than to allow them to progress and become a menace to others. I trust the day is not distant when our National government will do as well.

In conclusion, I wish to say a few words on treatment. In the search for a specific for tuberculosis, we have expected too much. We have too often sought for a remedy that, given to the poor consumptive, and lo! he is well. We have a very complex problem to solve, and must realize the limitation of remedies in this as we do in other diseases. One would hardly expect quinine to cure an abscess of the liver or spleen, complicating a case of malaria. Nor would we condemn the remedy if the patient should die of septicæmia, while he was also suffering from malaria.

During the last eight years I have used nearly all the specific remedies in this disease, including the old tuberculin, antiphthisin, purified tuberculin, oxytuberculin (Hirschfelder), watery extract (von Ruck), and several serums. Of these I regard the watery extract as the safest and best. It is certainly a great aid in the

successful treatment of tuberculosis, and gives results which, from present indications, will, in many cases, prove permanent. A few words as to its value and limitations may not be amiss. There is no doubt that it has a positive specific action on living tubercle, and I have often seen partly consolidated lung areas, which showed decidedly dull percussion note with bronchial respiration, return to normal under its use. It must, however, be remembered that these cases were under good climatic and hygienic conditions during the administration of the specific remedy. On the other hand, cases which improved under care and climate—the so-called climatic cure, more properly speaking, "latencies"—are very prone to recur. The active manifestations are gone, but the infiltrations are still present, ready to spring into activity if favorable conditions are supplied. Specific remedies can have no action on dead tubercle, and it is the difficulty in differentiating between living and dead tubercle that makes prognosis so difficult. It is often a matter of months to be able to determine whether a given infiltration would be reorganized, or would break down and be expectorated.

During the time of liquifaction of tubercle and formation of cavities, we have to deal with essentially a case of septicæmia, and it is only by attention to hygiene, by careful feeding, and the use of tonics, can we support the patient during this trying period. Specific remedies can not modify the course of this process. It can, however, bring about an artificial immunity which, in addition to the natural immunity of the individual, will prevent further extension of the disease, and with this increased immunity we often note the disappearance of tubercle, which otherwise would have broken down. In other words, this remedy has enabled me to bring about a recovery in cases which, in my opinion, would otherwise have proved fatal. Creosote and its derivatives have enjoyed considerable reputation as a remedy against tuberculosis, but I think they are chiefly of value in the treatment of the symptoms. Being partly excreted by the lungs, they modify the secretion, prevent putrefaction, and assist in expectoration. They have the

disadvantages of deranging the digestion and must be used with caution.

Much could be said in regard to the treatment of the various symptoms as they arise, and our success or failure very often depends on our care in meeting the various unfavorable manifestations. In conclusion, I will say but one word. In the successful treatment of phthisis, we must bring to bear upon our patient every influence within our power for his good. Make him live right, and do not depend upon treatment to the exclusion of hygiene.

DISCUSSION.

DR. M. M. SMITH, Austin: I desire to speak upon this question, which to me is a great question and one that concerns not only the medical profession, but the people of the world—the treatment of tuberculosis. When we consider the enormous death rate, and particularly that tuberculosis strikes our most favored ones, so to speak—the young man and young woman in the prime of life—this question should receive our careful attention, and it is one that is receiving the attention of the profession of the world today, as well as our legislative bodies. I shall discuss only very briefly the treatment of tuberculosis, from the reports given us by the sanitarium treatment, and these are very favorable ones. I had the pleasure of visiting during the past summer the Tubercular Sanitarium in the Adirondacks; also the Loomis Sanitarium at New York. I am free to confess that after visiting this institution I was agreeably surprised in reference to their treatment and the condition of their patients and the percentage of recoveries. I was invited to dinner at the Adirondack Sanitarium. I accepted the invitation and was asked to come into the dining room, and saw some seventy-five or eighty-five tubercular patients sitting around at the tables, just like we do at the hotel, and the question of eating my butter and drinking my milk came to my mind, so I left them; in fact, I was a little afraid to eat anything. However, I selected those articles that seemed to be perfectly well cooked. I made some inquiries of the physician in charge and he assured me that during the seventeen years existence, and for many years, had over 100 patients; that there never had been a physician, nurse or attendant that had contracted tuberculosis around the institution, showing that in such institutions, properly conducted, where every precaution is taken, you run small danger of infection. I had much the same experience at the other institutions that I have visited, and I wish to emphasize the point in reference to the treatment of this disease. I would say, put the patient to bed and keep him perfectly

quiet until the fever has disappeared entirely. Some think if they go to bed they will become ill and never be able to get out. When a case is admitted the first thing they do is to run over same carefully, make their examination of their patient, take their temperature, and put them to bed and keep them there until their temperature has disappeared, and at the same time they give them plenty of fresh air and sunshine. Regular diet is a very important matter with them; they see that they retire early and get their usual amount of sleep; they also teach their patients in these institutions to try to make an effort to keep from coughing, and it is remarkable what they have accomplished in the management in this way in teaching them to restrain and make an effort in that direction. Nutritious diet is a most important consideration, and we should especially see that they get plenty of the fats and albumoses, and we should encourage them in their eating; in fact, in addition to their regular meals they serve lunches between meals—their patients get five or six meals each day.

I have outlined in a general way the treatment that is best suited in these cases of consumption as they may arise. Another method of treatment is by forced feeding; they are given all the animal and vegetable food that they will take, in a concentrated form, tablespoonful three times a day, and they encourage them to eat their three meals regular and allow them to have fresh sweet milk and break up as many eggs into same as possible. One patient told me he drank three quarts of milk, and one patient took as many as sixteen raw eggs a day in addition to his regular three meals. Whenever necessity arises they give them a good dose of magnesium sulphate (one ounce). I think that this forced feeding is good. It causes them to increase in weight, and as a result a better condition of the patient is brought about.

DR. W. W. MACGREGOR: My personal experience has extended to where Dr. Smith speaks of in the Adirondacks. In all these tubercular conditions give your patients all they can digest and all they can absorb, and encourage eating, instead of giving them all these hypodermic injections of something we know nothing about.

Tuberculosis is a disease that is due to lack of nutrition, and this is the result of an error of nutrition. All do not have tuberculosis simply because they may have an inherited tendency that may make them susceptible to an acquired tuberculosis; but when they do acquire it, what is the result? They have a loss of vigor, a depression of the vital powers, lack of appetite; they do not eat, are run down, and they acquire this condition.

In the Adirondacks, where I have been, that principle is carried out to give the patient the greatest amount of nutrition that they can digest and absorb, and that is the principle of treating it. I do not take any school or any specific theories or treatment or anti-tubercular toxins—fresh, dry air,

good food, out-door exercise and methodical expansion of the lungs will accomplish much more than drugs.

DR. H. W. CROUSE, Victoria: There is one remedy that I have had some experience with in pulmonary tuberculosis, and have been able to secure good results from its use. This is glandulin, prepared by Dr. Hoffman, of Meerane, Saxony, Germany. It is a preparation made from the desiccated bronchial glands of sheep—a true glandular tissue. I have treated ten cases by this method. You should use the remedy by giving a 5-grain tablet three times a day for three days, then two tablets three times a day for three days, thus progressively increasing the dose until you are using fifteen tablets a day. We have, by this method, the utilization of a remedy theoretically proven—and clinically also—to be of marked advantage. It is but carrying out an organ therapy, suggested theoretically by the use of other remedies, such as mammary substance, in treating uterine fibroid and thyroid gland in cretins. In other words, that all racemose groups of glands have not only an external (in some of them) but a internal secretion of marked benefit to the system. It is a well-known fact that the bronchial glands are among the first pulmonary tissue that become diseased in pulmonary tuberculosis, so that by the giving of a substance which we are able to secure by the utilization of this remedy we are able to meet a deficiency no doubt brought about by the destruction of the bronchial glands. I have taken chronic cases of tuberculosis, where we had a bronchial involvement to a certain extent, no doubt a mixed infection, and have found one case, at least, which markedly improved with this treatment, in Victoria, which has an altitude of only forty feet above the sea.

DR. BOYD CORNICK, San Angelo: I regard the paper as admirable in its outlines for treating pulmonary tuberculosis, but it is all too brief. We can not go into too minute detail in the management of a case of consumption. The most essential thing that occurs to me in the management of a case of pulmonary tuberculosis is that it shall be taken in charge at an early stage, before serious harm has been done—before irreparable damage to the lungs or system has occurred. Our cases should have the same careful supervision as at a good sanitarium, where they are under medical observation at all times.

We have to thank Brehmer, Dettweiler and other sanatorium physicians for demonstrating that pulmonary tuberculosis is the most curable of all chronic diseases. The great majority of general medical practitioners still rely too much upon medicaments in treating this disease; upon drugs which at best serve only to palliate symptoms; and they often fail in consequence to appreciate at their true value the curative virtues of diet, in promoting nutrition, of carefully regulated rest and exercise if fever be present, of a

dry and sunny climate if the patient can possibly avail himself of it at an early stage of his disease, of an open air life by night and by day, which is possible, to an ideal degree, only in a dry climate.

The value of climate is better appreciated now than formerly, and my own personal experience as a tuberculous health seeker, as well as my observations of a great many others in the West, is that a dry climate is worth more in promoting appetite and improving nutrition in pulmonary tuberculosis than all the medicaments in the official pharmacopœia. Yet many patients fail to derive lasting benefit from it. They have been advised to "rough it," and they often follow this unwise advice literally, when an intercurrent fever cries out for physical quiet or actual rest in bed for a few days in order to avert disaster. The clinical course of tuberculosis varies so greatly from time to time that only by continuous medical supervision of the patient's daily life—his down-sittings and his up-risings, so to speak—can a menacing tuberculous infection be brought in many instances to the stage of eventual complete arrest.

Dettweiler, in protesting against over-medication, said: "The kitchen is my pharmacy." And only when we fully realize that the highest possible nutrition of a tuberculous patient is the goal at which we must aim; and that a strict supervision of the diet, with judicious regulation of rest and exercise according to the presence or absence of fever, together with a dry and sunny climate to promote appetite and digestion, are our most helpful means to this end, then, and not till then, can we hope in private practice to approximate the favorable results of sanatorium treatment.

DR. H. J. CHAPMAN, San Antonio: I appreciate the discussion that my paper has brought forth, and am pleased to see the interest taken in it. I will simply repeat, in closing, what I have already said in the paper. We must bring all the resources of medicine and hygiene to bear on these cases and must keep them under observation until well, no matter if it takes three months or three years.

Again, increase of weight is most valuable, but it is not the whole story; nor is it safe to count a case cured because he has gained several pounds in weight. It is only with the disappearance of the tuberculous lesions—not simply an absence of rales, if the trouble is in the lungs—that we may be safe in pronouncing a case well. I have also obtained valuable information as to the extent of apparent cures by giving the full test dose of tuberculin at least six months after all specific medication had been discontinued. I would regard only cases which failed to react as well, no matter how much they had gained in weight or what might be their personal feelings about being well.

A COMPLICATED CASE OF TYPHOID FEVER.

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VICTORIA, TEXAS.

In this report there will be no attempt at exploiting new drugs or original methods of treatment, but to chronicle a most persistent, pernicious and complicated case of enteric fever.

The history of ten days prior to my first visit of evening: temperature, insomnia, anorexia, diarrhea, intense frontal headache, suggestive of the ambulatory type.

Was called on the morning of January 15th to see J. C., male, age 29; found temperature 102 1-10, pulse 100, respiration 18; frontal headache, intense pain confined to middle third of sternum, which increased markedly upon swallowing either hot or cold liquid.

Inspection, palpation, percussion and auscultation over entire thorax, negative; abdomen flaccid, skin dry and parched, tongue red, pointed, tremulous; fauces larynx, normal; urinalysis showed the usual decrease in secretion, high color and specific gravity; albumen, sugar and casts absent; diazoreaction negative.

The usual treatment—liquid diet, hydrotherapeutic measures, intestinal antisepsis; with codeine internally and heat locally for sternal pain; trional for insomnia.

January 16th: Nervousness and insomnia aggravated, mediastinal pain increased; temperature 104 3-5, pulse 90, respiration 18. Again, a thorough examination of the chest elicited no information whatever. Codeine in large dosage was administered hypodermically by the nurse; otherwise, no change in treatment. While the temperature, pulse, respiration and general condition merit no especial mention for the next few days, the mediastinal agony

claimed a great deal of attention, increasing in violence, as it did continuously, the suffering was excruciating.

Morphine and atropine, passiflora incarnata, papine, salol and antikamnia, bryonia and hyoscyamin, opium, bromides, heat, cold, sinapsims, inhalations of volatilized tincture benzoin compound, and tincture opii camphor and eucalyptol, all seemed to have equal effect, which was nil, at least for eight days. At the expiration of this period, however, the storm began to abate, and finally disappeared.

As to which drug, or combination, deserves mention, I am unable to say. The vital question that prompted me to report this case was the cause.

Too acute for tuberculosis, fairly soon for typhoidal invasion of the lymphatics, lacking such characteristics of abscess formation as sternal bulging, fluctuation, dullness, septic rigors and temperature; much more rapid in appearance and disappearance than a tumor. In addition there was absence of venous and arterial engorgment in the cervical region; no pupillary changes, injected conjunctiva, purple lips or bronchial compression, as would be indicated by absence of bronchial sounds over one lung (usually the left); no wheezing, tracheal sounds; no difference in the radial pulse to show subclavin compression.

The next phenomenon replete with interest is the diarrhea; beginning on the third day and lasting something over three weeks, and successfully evading the entire list of such well known astringents as bismuth, benzo-naphthol, salol, chalk mixture, ipecac, nitrate silver, acetate lead, tannigen, turpentine emulsion, opium in various forms, and atropine. The opiates were devoid of all power except to narcotise.

Another fact worthy of attention at this particular time was the very free diuresis—50 to 60 ounces was the per diem amount, and on one or two days the quantity reached 80 ounces. Simultaneously, the bowels unloaded themselves at almost hourly intervals.

When the fourteenth day was reached, the temperature (7 p. m.) took a sudden excursion upward—104 4-5—pulse 160, respiration

30. Collapse was imminent; 400 c. c. deci-normal salt solution was injected into axilla, strychnia, sparteine, nitro-gylcerine and whisky were increased. Hydrotherapeutic means to combat the temperature availed nothing; temperature reached 105 7-10; delirium ferox set in, patient becoming so maniacal that restraint was necessary; involuntary evacuations of bowels and bladder, with the diagnosis of intestinal toxæmia decided upon; minute doses of mild chloride were given hourly deci-normal, repeated 500 c. c. (ten hours) from the initial injection.

On morning of the fifteenth day, though the temperature registered 105½, the pulse reacted to the deci-normal salt solution, as evinced by improvement in volume and beat of 120. In eighteen hours mind cleared, nervousness decreased, and as the mild chloride asserted its influence upon the intestinal tract, the temperature fell to 103½. Twelve hours later the thermometer indicated 100 4-10. General condition was apparently much bettered, pulse 100, more volume, and decidedly stronger.

This calm, however, was ephemeral, as (three days) later the rapid rise in temperature, increased heart's action, cough, bloody expectoration, sudden onset of delirium, and a thorax full of rales, told but too plainly that another complication had come to give battle. This was absolutely the first time that a chest examination had revealed the slightest derangement, and seven days after complete cessation of the diastinal pain.

Ammonia, volatilized eucalyptol, and the glycerine jacket exerted good influence. In six days (twenty-third day of illness) lungs cleared up entirely; not a rale could be heard; expectoration normal; temperature normal; pulse became better than at any time during the illness.

Twenty-sixth day: To dispel monotony, the right leg and foot became œdematous; an enormous axillary abscess developed simultaneously, with bed sores on hips, coccyx and lumbar regions, and by the twenty-six day sufficient pus had been produced at these multiple foci to induce a violent septic chill, followed by a rise of tempeature to 106 and a pulse of 180; chill was repeated on two fol-

lowing days; œdema of left leg came on, sloughs loosened and fell from the bed sores. With extreme restlessness and maniacal seizures, hypostatic pneumonia announced its second visit. The accompanying insomnia was simply frightful; delerifacients accomplished possibly as much as "absent treatments." In succession bromide, cannabis indica, jamaica dogwood, camphor, chloral, opium, morphine, Hoffman's anodyne, and musk were tried, but tried in vain.

The terrific strain now began to tell upon the heart, and even under enormous doses of strychnia, sparteine, brandy, coffee, ammonia, the pulse could not be counted; the mania increased to a veritable storm; the kidney secretion dwindled to three and four ounces daily, and even that had to be drawn from the bladder.

On the forty-fifth day the mania was replaced by coma, and with the development of gangrenous dermatitis as a final complication, the end came on the forty-ninth day.

To summarize, one would doubtless be attracted by such a complexity of complications as the mediastinal agony; the diarrhea and concomitant polyuria; the intestinal toxæmia; the two separate attacks of hypostatic pneumonia; the œdematous arm and legs; the axillary abscess and bed sores, and lastly, the gangrenous dermatitis.

SCARLET FEVER.

G. T. THOMAS, M. D.,

ROGERS, TEXAS.

Scarlet fever is an acute, contagious, self-limited disease, one attack usually protecting the individual through life. The period of incubation is usually from two to six days; that of invasion from twelve to twenty-four hours; that of eruption from four to six days; that of desquamation from three to six weeks. The disease may be communicated at any time from the first symptom of invasion throughout desquamation, and sometimes even during the existence of purulent discharges from the nose, or other mucous membranes. It is usually ushered in by vomiting, high fever and sore throat, and is characterized by an erythematous rash, which appear first upon the neck, spreading rapidly over the entire body. The chief complications are otitis and membranous inflammations of the pharynx, which frequently extend to the nose, more rarely to the larynx. The most frequent sequelæ are deafness and nephritis.

ETIOLOGY.

Analogy lends to the belief that scarlet fever is due to a micro-organism, but as yet its nature has not been discovered. The complications are usually associated with the growth of the streptococcus pyogenes. Some have gone so far as to claim that this germ is the cause of the disease. From present knowledge, it appears rather to play the role of a secondary or accompanying infection for the development of which the mucous membranes of a person suffering from scarlet fever seem to afford most favorable conditions. To the streptococcus may be ascribed the membranous inflammations of the tonsils and pharynx; the otitis the inflammations of the lymph nodes, and all cellular tissues of the neck, and

probably the nephritis, pneumonia and joint lesions. In many of the above conditions the streptococcus is associated with other pyogenic germs, and in some cases with the diphtheria bacillus.

PREDISPOSITION.

The susceptibility of children to the scarlatinal poison is much less than that to measles, still it is much greater than that of adults.

MODE OF INFECTION.

The chief source of infection is the patient himself. It is somewhat doubtful whether the poison of scarlet fever can be conveyed by the breath, but it may be by the discharges from the membranes involved. Also from the scales, during desquamation, and probably from all the excretions. Infection often takes place from the carpets or furniture of the sick room and from the clothing of the patient.

DURATION OF THE INFECTION PERIOD.

There is no evidence to show that the disease is communicable during the period of incubation. It, however, becomes so from the beginning of invasion, even before the rash appears. Infection is doubtless most active during the febrile period from the second to the fifth day, and next to this during the period of active desquamation. The average duration of the contagion might be placed at six weeks.

LESIONS.

The only essential lesions of scarlet fever are those of the skin and the mucous membranes of the throat. The other changes occurring in this disease are considered in the light of complications, under which head they are described.

SYMPTOMS (INVASION).

As a rule the invasion of scarlet fever is abrupt, the symptoms at the onset being directly in proportion to the severity of the

attack. In the majority of caes there is vomiting, a rapid rise of temperature and soreness of the throat. After the vomiting is repeated it is frequently forcible and without nausea. In severe cases the rise of temperature is very rapid to 104 or 105, and in the mildest cases it may not be more than 101.

ERUPTION.

Eruption usually appears from twelve to thirty-six hours after the first symptoms of the invasion, exceptionally not until the third or even until the fifth day. A later appearance than this is somewhat doubtful, for the rash not infrequently recedes and reappears, having been overlooked in the first instance. Variations in the eruption are very frequent and often extremely puzzling. In mild cases the rash is not seen upon the face; is often faint upon the body, and may be present only upon certain parts of the body, and may last only one day; escaping notice altogether sometimes. It may be absent in some very mild cases, in certain others where the throat symptoms are severe and in malignant cases. In the very severe cases many irregularities are seen, both as to time, of the appearance of the eruption, and its character. Sometimes it occurs as large, irregular patches; at others it is maculate, closely resembling the rash of measles. With the eruption at its height, there is intense itching or burning of the skin, and severe cases show considerable swelling, chiefly noticeable upon the hands and face. All the constitutional symptoms increase in severity as the rash develops, and usually diminishes as the rash fades.

DESQUAMATION.

Shortly after the rash has faded, there is an exfoliation of the dead epidermis, known as desquamation. This is even more characteristic of the disease than the rash. It is usually first seen upon the neck and chest, where it appears as fine scales or small patches. The desquamation of the trunk is completed from one to three weeks. If baths or inunction are being used, it is scarcely perceptible. It continues longest where the epidermis is thickest, viz.:

upon the hands and feet, and here it lasts from three to six weeks. The fingers and toes during desquamation are characteristic. The finger tips usually peel first, and the new epidermis is pink and fresh looking, while that which has not yet separated is of a dull, grayish color and loosened at the margin.

COMPLICATIONS AND SEQUELAE.

Throat.—Three distinct forms of angina are seen in scarlatina, viz.: erythematous, membranous, and gangrenous. Erythematous angina can hardly be ranked as a complication, as it is as constant as the scarlatinal rash. Usually there is only the general blush over the entire pharynx, with the fine red points upon the hard palate. But there may be seen upon the tonsils grayish-yellow spots, resembling those of follicular tonsilitis, which can be wiped off, leaving a clean surface. This simple angina is at its height during the maximum temperature, fading as the temperature falls, and does not extend to adjacent mucous membranes.

Membranous Angina.—These cases were formerly classed as scarlatinal diphtheria, but whether this process was identical with primary diphtheria or not, was for a long time a subject of much discussion. This question has, however, been settled by bacteriologists. It is now generally agreed that the membranous angina which occurs early in scarlet fever and that which develops at the height of the disease are almost invariably due to the streptococcus, the diphtheria bacillus being rarely found, but the cases which develop late in the disease after the primary fever has subsided are almost invariably true diphtheria. The bacillus being regularly present, the latter condition is to be regarded as scarlet fever, complicated by diphtheria.

GANGRENOUS ANGINA.

This is seen only in the worst cases of scarlet fever. The process may be gangrenous from the outset or preceded by a membranous inflammation. There is a fœtid odor to the breath, irritating discharges from the nose and mouth, with considerable glandular

swelling. The tonsils are gray or grayish-black in color, and large masses of necrotic tissue may be removed with the forceps from the tonsils, fauces or pharynx, and sometimes sloughing occurs in cellular tissue of the neck. Blood vessels of considerable size are sometimes opened, and serious or even fatal hemorrhage may occur. Little or no reparative process is seen. The constitutional symptoms are those of great asthenia, prostration and profound cachexia, followed almost invariably by fatal termination. I shall only refer to a few of the complications on account of their number.

THE OTITIS.

The otitis is due to the direct extension of the infection from the rhino-pharynx. It is the most frequent complication of scarlet fever, and in doubtful cases may have some diagnostic importance. As a rule, the younger the child the greater the liability to otitis. It is more frequent during winter than other seasons. Like all complications, it varies greatly with the epidemics, and is closely connected with the severity of the throat symptoms. As a rule, both ears are affected, but not simultaneously or at least rupture occurs at different times. This is most frequent early in the second week, but may occur during convalescence. In the cases where otitis develops at the height of the disease, there are, in some cases, no new symptoms, in others there are pain and deafness. If it develops at a later period, there is usually a rise in the temperature, which falls after the rupture of the drum membrane takes place. The form of inflammation may be catarrhal or suppurative, and in some cases causes permanent deafness.

KIDNEYS.

Albuminuria accompanies most all severe cases of scarlet fever, in many this is simply the ordinary febrile albuminuria, due to the acute degeneration of the kidneys. In these, with severe throat complications and in nearly all septic cases, there is an acute inflammation of the kidneys, usually of the variety described as acute exudative nephritis. This occurs at the height of the febrile

process, and is rarely accompanied by dropsy, but albuminuria, casts, and even blood, may be found in the urine. The most severe and the most characteristic renal complication, and that generally designated as post-scarlatinal nephritis, is a diffuse nephritis, which, in most cases, develops during the third week of the disease. It is accompanied by general dropsy; the urine is scanty, and not infrequently suppressed, and contains a large amount of albumin and a great number of casts of all varieties. It may cause death by acute uremia or may be followed by permanent damage to the kidneys.

THE JOINTS.

Acute articular rheumatism may occur coincidentally with the development of the scarlatinal rash, and occasionally during convalescence in patients who have a predisposition to that disease. Acute swelling of the joints is sometimes of pyogenic origin.

THE LUNGS.

The pulmonary complications are neither so frequent or so important as in measles.

THE DIGESTIVE SYSTEM.

Vomiting is the mode of onset in the majority of cases, but rarely continues through the attack. Late in the disease it is a frequent symptom of uremia. Diarrhea may be associated with it under both conditions. The tongue is nearly always coated, and clears off in quite a characteristic way, which, with the prominent papillæ, gives rise to the strawberry appearance.

DIAGNOSIS.

The characteristic symptoms of scarlet fever are the abrupt onset usually with vomiting, the marked elevation of temperature, the erythematous condition of the throat and the appearance of the rash within twenty-four hours. Before the rash, it can not be diagnosticated from tonsilitis, or many other diseases. The diffi-

culty of diagnosis usually depends upon the irregularities of the eruption, both as to time of its appearance and its character. These variations are seen in the mildest and in the most severe cases. In the former the temperature may not be above 100° F. The rash may last less than a day and may be seen only on the neck and chest, and probably be overlooked altogether. Nothing is positively diagnostic in those cases, but if the desquamation follows it is positive.

PROGNOSIS.

The mortality of scarlatina varies greatly in different epidemics, ranging from 3 to 40 per cent.

TREATMENT.

There is as yet no specific for scarlet fever, so the treatment is one of management of symptoms and complications. Mild attacks require scarcely any treatment at all. The authorities tell us that patients should be kept in bed for two or three weeks, but I have not been able to succeed well in this respect. During the height of the eruption, the intense itching of the skin may be allayed with a weak carbolic solution, or by inunctions with vaseline, or free use of rice powder. Plenty of fresh air should be secured in the sick room. As soon as the fever and rash have disappeared, daily baths of soap and warm water should be used, after which the entire body should be anointed with carbolized vaseline, for the purpose of facilitating the desquamation and disinfecting the scales. The temperature often does not require an antipyretic; if so, a cold bath or wet pack or sponging with cold water will usually suffice and is much safer than the coal tar preparations. The nervous symptoms are usually better controlled by applying ice to the head and sponging with cold water than by medication. As soon as the pulse becomes weak or rapid and irregular with a feeble first sound of the heart, stimulants should be given, no matter at what stage of the disease. In septic or malignant cases or in those accompanied by severe angina adenitis or cellulitis, alcoholic stimulants must be

used freely; carried even to the full toleration of the patient. Digitalis is next in value to alcohol and is especially indicated where the pulse is weak and soft, with a low tension. The fluid extract may be given to a child five years old in minim doses, four times a day in the beginning and later, if necessary, with greater frequency. Strychnine is also useful and may be combined with digitalis or given separately, the usual dose being 1-200 of a grain for a child five years old, but may be increased in amount.

The erythematous sore throat requires no treatment more than a mild antiseptic gargle. If there is a profuse nasal discharge, nasal syringing with a warm saline or boric acid solution may be used with the hope of preventing infection of the middle ear. The local treatment consists of various mixtures, to be used as sprays or mops, etc. Most all physicians have a preference for different remedies, such as iron and glycerine combined, ichthyol and glycerine, creolin in different strengths, peroxide of hydrogen, and lime water, equal parts, and various other remedies indiscriminately. I have used quite a number, and I am rather inclined to the ichthyol, one drachm to the ounce of glycerine.

Gangrenous inflammation of the tonsils or palate is sometimes benefited by injections of 10 per cent solutions of carbolic acid and glycerine, but most such cases prove fatal, no matter what the treatment. During convalescence, tonics, particularly iron and digitalis, are called for. The urine should be examined frequently for a long time after. Antiseptic gargles and a nasal spray should be used as long as a purulent discharge from the nose and pharynx continues.

SECTION ON OBSTETRICS AND DISEASES OF CHILDREN.

CHAIRMAN'S ADDRESS.—SOME FACTS CONCERNING THE HISTORY AND DEVELOPMENT OF THE OBSTETRIC ART.

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For many centuries during the early history of the world we have no knowledge of any assistance being rendered to a woman during parturition. Since the process is a physiological one, and people lived under physiological conditions, there were no causes for the fœtus meeting with obstruction during its passage through the parturient canal. Hence it is hardly necessary to say that children were born into this world before obstetricians were educated to preside over their introduction.

If the evolutionist is to be believed, for countless generations the human female brought forth her offspring unaided by science or anything else, save what hereditary experience bestowed equally with her upon the other animals, who were her neighbors. She was strong because natural selection had sent the weak to early graves. The pelvis was large and its bones elastic, because no restricting clothing had been worn. The joints were movable and permitted of a great deal of extension, because the first child was born as soon as possible after puberty, while the tissues of the body still possessed the yielding pliability of youth. The heads of the children were soft and compressible because the diet of the mother consisted of uncooked foods, raw meat, fresh fruits, nuts and roots forming the larger part.

Esthetic education makes the human race susceptible to pain. This was not so in early days; the more tenderly people are reared, the more sensitive they become to bodily injuries. We are told that the savages of the Philippine Islands drag themselves along without complaint, just as long as life lasts, though horribly mangled by the shots of the enemy. So, in remote times, the mothers of our race gave birth to their children without complaint, and for the most part without suffering.

Natural selection roots out all deformities; no weak offspring can survive to give birth to children in turn.

Should malposition of the child hinder labor, unless they are such as the continued efforts of nature might overcome, both mother and child without assistance would be sacrificed.

Human life is cheap among savage people. In ancient Mexico it is said that more than 100,000 people were sacrificed to the gods in a single year, and that seldom a year went by that 20,000 or 30,000 did not share the same fate. In the days of the Spanish Inquisition 100,000 persons frequently met death by fire and by torture, in a single year, to satisfy the demands of the sainted fathers of the church.

We hear even now of squaws giving birth to their offspring without any of the display that we are familiar with among the civilized. They retire into the forest alone, are delivered without assistance, arise, wash themselves and child in the water of some neighboring brook or pond, wrap the baby in a piece of fur or blanket, and then hurry on to join the rest of the tribe. The ordinary confinement to a bed for an indefinite period of time is omitted.

We are familiar with the custom of secluding females, as it is practiced by some Asiatic countries even to this day. This prevents them from availing themselves of the services of a male physician, and this custom is, I suppose, responsible for the fact that midwives have in most ages had sole charge of the process of birth until the last century or two. We read in sacred history that at the birth of Jacob and Esau, that the hand of Esau came down first, and that the midwife tied a red string around the wrist to show that he

was entitled to the birthright, though the body of Jacob came into the world before that of Esau. Later we read of the midwives that attended on the Hebrew women during the Egyptian servitude; how they were not quick enough to get to the house before the women would have had their children, so that they were unable to comply with the command of Pharaoh to strangle all of the male children which were being born.

The same record speaks of confinement stools, which were common in those days. We read in the book of Job concerning abortions and untimely births—children that never saw the light—showing that such things were known at the time the book of Job was written, which is probably the most ancient book extant. The men did not interfere in such cases unless death was inevitable; then they sometimes cut the child in pieces, and tore it away with hooks, an operation which was generally fatal to the mother as well as the child. The fatality was partly due to rough and unskillful handling, and partly to the long delay before they interfered.

The ignorance of men concerning the subject of midwifery is shown by an expression of one Dr. Culpepper, in his book on "Obstetrics," published about two hundred years ago. He remarked that he would have known more about the subject if he had ever witnessed a case of confinement. He bewailed the fact that he did not live in Holland, for there it was the custom for wives to be confined on the laps of their husbands, and if such had been the case he might have had plenty of information, as he was the father of twelve children.

There are three prominent eras in the science of obstetrics—the invention and use of the forceps by the Chamberlains; the discovery and use of ether and chloroform anesthetics by Martin, Jackson, Simpson and others; and last, but not least, the discovery and advocacy of the germ theory by Lister, Koch and others.

The first gives us a means of mechanical assistance, which is of the utmost importance to mother and child; the second makes it possible to perform the mechanical part of the operation in the

most skillful manner; while the third reduces to a minimum the mortality of the lying-in period, and more especially where operative interference has been called for.

I will devote a few moments to the consideration of the discovery of the obstetric forceps. A crude forceps was used in the twelfth century, but as we are told that the inner surface of the blades were provided with teeth intended to penetrate the head, it was evident that they were only intended for use on dead children.

About the year A. D. 1569 there settled in England a Huguenot family by the name of Chamberlain. The head of this family, named William, was a practicing physician. He had two sons, both named Peter, who followed their father's profession. The younger Peter was in continual conflict with his professional brethren. On one occasion he was heard to boast, in an offensive manner, that he and his brother excelled all others in dealing with difficult labor cases. This was in A. D. 1616, and is the first mention of the secret which was supposed to have existed in the Chamberlain family for three generations. Their secret enabled them to grow rich in the practice of their hidden method of treating these cases.

Instead of honoring those men for the discovery of one of the most important inventions in medicine, posterity has justly condemned them, that for their own gain they deprived the world of knowledge that might have saved thousands of lives while this secret remained well guarded by the Chamberlain family.

The younger Dr. Chamberlain had a son, who was also named Peter, who was a remarkable man. He possessed great, but ill-directed, talents. He was an accomplished linguist and an extensive traveler. It is to this man that some have credited the invention of the forceps, but there is no doubt but he inherited the secret from his ancestors. He, in turn, had a son named Hugh, to whom he taught the secret of the forceps. Hugh was extravagant and spent all of his money, and determined to sell the family secret. He went to Paris and offered to sell it there, and to demonstrate the value of his secret attempted to deliver a deformed dwarf at full term, but failed completely, and the woman died with a ruptured

uterus, still undelivered. This ended the negotiations for a sale in Paris. He was then heard of in Amsterdam, and had the good fortune to sell his secret to the Royal College of Physicians and Surgeons of Amsterdam. This college at once had a law passed prohibiting any one from practicing midwifery who did not possess this valuable secret, which was held at an enormous price. This continued until about the middle of the eighteenth century, when two public-spirited physicians bought the secret and made it known to the world. This was a drawing of only a single blade of the obstetric forceps. Two blades were necessary; they were fenestrated; had only the cephalic curve, and were fastened together with a string.

The secret leaked out in England about 1755, and before the end of the century was well understood. This model was not used long before its defects became manifest. It was difficult to introduce, and the necessity of binding the blades together with a string was inconvenient.

The pelvic curve was added in England by Smellie, and in France about the same time by Levret. Both invented a lock. These locks were different, but characterize the English and French instruments of today. The Simpson and Barnes forceps is only a delicate modification of the Smellie forceps, and the Hodge is modeled after the Levret. So we can easily see that entirely new ideas are scarce, and have always been since the days of Solomon. Hence we can understand that the obstetric forceps is a growth rather than an invention, as is nearly every therapeutic measure known to medicine.

PART II. ANATOMY.

As the mechanism of labor is essentially a process of accommodation between the fœtus and the passage through which it must pass, it is apparent that obstetrics lacked a scientific foundation upon which to build the superstructure of the obstetric art. This advance was made in 1543, by Andreas Vesalius, to whom we are indebted for the first accurate description of the anatomy of the bony pelvis and the soft parts connected therewith.

Prior to the publication of his observations it had been generally believed that the birth of the child could not take place until the pelvic cavity had become increased in size by the separation of the pelivc bones. Vesalius demonstrated the fallacy of this conception, and showed that the pelvis, for practical purposes, should be considered an unyielding ring.

Julius Cæsar Arantius, Professor of Anatomy in Bologna, in 1559, also made important contributions to the subject, and was the first to point out the existence of contracted pelvis.

The reason why the teachings of these great anatomists did not exert more influence was due to the fact that no less an authority than Ambroise Pare still continued to teach the doctrine of the separation of the pelvic bones during labor, and promulgated it in his writings.

Up to this time the practice of obstetrics was almost entirely in the hands of the midwives, but strange to say all of the important advances in the science of midwifery were made by men.

In 1701 Heinrich Deventer wrote his "New Lights for Midwives," in which he made a thorough study of the anatomy of the pelvis. He also felt called upon to make an apology for taking up so much time in considering a subject of so little importance.

Smellie was the first English author to devote particular attention to obstetrics. In his work, published in 1752, he gave a most accurate description of the various measurements of the pelvis, and especially of the antero-posterior diameter, which we employ to this day. Almost simultaneously with Smellie, Levret, the French, and Stein, the German obstetrician, made similar observations; and later Playfair of England, Naegele and Litzman of Germany, and Hodge of our own country, contributed much valuable information on the subject of obstetrics.

It has generally been accepted that Julius Cæsar came into the world as the result of an important obstetrical operation, to wit, Cæsarian section, and hence his name Julius Cæsar. Some deny this statement, as his mother, Julia, lived many years after the birth of her son, and besides that Julius was not the first of his

name, as there was a priest named Cæsar who lived many generations before. However, there was a law in Rome at that time that required the operation should be performed upon a woman dying during the last few weeks of pregnancy.

This law existed during the reign of the Cæsars, hence was known as the Cæsarian operation, which was only performed occasionally upon dead women, until the beginning of the sixteenth century. We are informed by Caspar Bauhm that the first Cæsarian section performed upon a living woman was done in 1500 A. D. by one Jacob Nufer, a castrator of pigs, residing at Sigerhausen, Switzerland, with the recovery of the woman, after the midwives and barbers had given her up to die.

Probably one of the earliest obstetrical operations was the delivery of the child by traction on the feet when they had protruded from the vulva.

From the time of Hippocrates to the sixteenth century head presentations alone were considered normal, and hence all authorities, with the exception of Celsius, advised the conversion of breech into vertex presentations, even though it was necessary to amputate the limbs of the child.

After the methods of Ambroise Pare podalic version was rendered more or less rational, so that in the seventeenth century Mauriceau advises this method of podalic version, which is in general use at the present time.

The ancients are credited with having made use of various drugs that may have mitigated pain, in some faint degree; but except for the employment of a deadly gas of the stone of Memphis to a very dangerous extent could anesthesia be produced, so it seems that all hope of a safe anesthetic must have been lost for many centuries.

And no better did the moderns succeed until about the middle of, and more especially the latter half of, the nineteenth century. In about 1846 Dr. Wm. Morton, of Boston, succeeded in using the vapor of sulphuric ether for surgical operations, and a year later the great Simpson, of Edinburgh, used chloroform anesthesia in obstetrics.

In those days men who witnessed for the first time a patient undergo an important surgical or obstetrical operation, while in a deep sleep, went away almost delirious with joy.

It was soon found that where antepartem operative procedure was necessary it afforded, not only immunity from pain, but a cessation of the natural contractions of labor, rendering the introduction of the hand much easier. It was also found that when lightly administered the pain might be in a great measure relieved without the loss of consciousness and arrest of the regular rhythmical contractions of the uterus.

It is quite wonderful to relate that the objection to the use of anesthetics in obstetrics came from the church. Many prominent preachers and theologians claimed that the use of anesthetics in obstetrics was prohibited by the Scriptures. They claimed that Holy Writ declared that women should bring forth their children in pain and sorrow. Today a physician would laugh at a minister who would advocate such theories, although in those days many sermons were preached in denunciation of such means to defy God and prevent the fulfillment of His divine will. At last they were satisfied by a scriptural quotation from a physician, who learned in the text of the Bible that when the Lord was about to take a rib from out the side of Adam, in order to make for him a life companion, he caused a deep sleep to fall upon him and removed the rib while Adam was unconscious, and that Adam suffered no pain from the surgical operation. All this looks very amusing at this date, but it was quite serious then. Hence, in this good day, the early part of the twentieth century, chloroform or ether constitutes one of the most important articles of the obstetrician's armamentarium.

The great discovery of the contagious nature of puerperal fever was made in 1843, by Dr. Oliver Wendell Holmes, of our own country, better known at the present time as a poet than as an obstetrician, although he sounded the keynote that saved the lives of thousands of women.

Semmelweiss, the great German author, published several arti-

cles on the subject of puerperal sepsis from 1844 to 1848. This view, as promulgated by both home and foreign physicians, fell upon deaf ears. The very men who should have first recognized its truth, who should have most heartily welcomed the revelation, opposed the new doctrine set forth by these gentlemen with all their might, because it ran counter to their teachings.

At this time in America two men were so pre-eminent in obstetrics that they might be said to be without rivals. These men were Hodge and Meigs, holding, respectively, the chairs of obstetrics in the University of Pennsylvania and Jefferson Medical College. Meigs directed against Holmes's teachings all the satire and ridicule of which his brilliant mind was capable, and Hodge inveighed against it with ponderous invectives. Both frequently descended to undignified abuse. But in spite of all this the doctrine of the contagiousness of puerperal fever made rapid headway, and the immediate successor of Hodge, Dr. Penrose, taught it most impressively. This was in America. The trial in Europe was not less shameful to the profession at large.

In 1846, Semmelweiss, of Vienna, was struck with the frightful mortality in one of the maternity wards, while in a neighboring ward it was scarcely one-tenth as great. He discovered that in the first ward the women were attended by students who were in the habit of coming fresh from the post-mortem rooms of the pathological department of the hospital to the bedside of their parturient patients. In the other ward the patients were attended by midwives. Semmelweiss conceived the idea that the students carried putrid material on their hands from the post-mortem tables to the patients in the hospital, and that these materials were responsible for the large number of inflammations and fatal fevers that followed their work. He arranged that no student should examine a woman until he had carefully washed his hands in chlorine water, and the result of this regulation was fairly startling. The death rate was thus reduced in less than three years from 11 to 1½ per cent. Semmelweiss recognized the transcendent importance of his discovery. He foresaw something of the lives preserved and the

homes kept from bereavement, the mothers saved to their children, and wives saved to their husbands in millions of families—the incalculable diminution of human suffering which his discovery promised to the world.

For more than twenty years after the discovery of Semmelweiss the mortality of the great lying-in hospitals of Europe was kept as high as 10 per cent. Then came the brilliant work of Pasteur, and the practical work of Lister, and the general acceptance of the germ theory of diseases. Steadfeldt, of Copenhagen, in 1870, was probably the first to adopt Listerism in the maternity of that city, and it was soon taken up by the principal hospitals of Europe and America. And today, with many improvements in technique, it is universally practiced throughout the civilized world, both in hospitals and in private practice, by all regularly educated physicians.

MANAGEMENT OF BREECH PRESENTATIONS.

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In the management of breech presentations the attitude of the accoucheur during delivery, so long as there is no immediate danger to the child or mother, should be one of watchful observation. As a rule, the results to the child are unquestionably more favorable if nature does her work unaided, but should there be any faltering in the natural forces, the physician should be in readiness to avert, by prompt interference, the perils which, in pelvic presentations, are associated with delay. Pains should be taken to preserve the membranes until dilatation is complete; therefore, unnecessary examinations should be avoided. The patient should be placed upon her side and cautioned not to strain, and after the rupture of the membranes it is best for the expulsion of the trunk to take place slowly; but when the hips appear at the vulva, the attending physician should be ready to extract at once in case of emergency. The patient should be placed across the bed, with hips well over the edge of the bed, and she should be instructed to bear down with the pains.

The question of anesthesia is not always easy to decide. It is very useful in unruly patients, but it sometimes lessens the pains, and besides, you lose the very beneficial coöperation of the intelligent patient, which is a drawback to its use. The rectum and bladder should both be emptied. The operator should have at hand in case of need forceps, a soft fillet, warm napkins, hot and cold water.

The operation is divisible into three acts: First, extraction of the trunk as far as the shoulders; second, extraction of the arms and shoulders; third, extraction of the head. The extraction of the trunk should take place slowly, and tractions should be made during

the pains only, and it is desirable that the uterus be closely retracted upon the child during the entire period of its expulsion. When this does not occur, the arms are liable to be pushed upward to the sides of the child's head, the chin to become extended, and the delivery of the head would become very difficult. Hemorrhage, too, is more likely to follow hasty delivery than where the uterus has had time to pass into a state of complete retraction; therefore, firm pressure should be made upon the uterus through the abdominal walls, so as to maintain firm contraction upon the head of the fœtus. Traction should be made downward and backward in the direction of the superior strait, until the breech comes in contact with the floor of the pelvis.

When the breech alone presents, with both extremities reflected upwards parallel to the anterior surface of the child, spontaneous delivery is sometimes prevented by the fact that the extended limbs act as splints, which interfere with the lateral flexion of the trunk, and, consequently, with its accommodation to the curve of the parturient canal. If in pure breech presentations obstetrical aid becomes necessary, the operator is embarrassed by the absence of a natural handle, by means of which extraction can be effected; but if the child is of ordinary size, and the resistance at the pelvic floor is not too great, the expulsion of the child may sometimes be effected by graduated pressure upon the fundus of the uterus. Should this measure fail, manual extraction should be attempted; the index finger should be inserted into the fold of the anterior groin, and traction made directly downward. If the breech is low, both index fingers may be used, one in each groin; but should you fail by manual extraction (which you are very likely to do, especially in primipera), then instrumental aid becomes necessary. The choice consists of the forceps, the fillet, the blunt hook, and, when the child is dead, the cephalotribe, in the order given.

But the forceps being designed to fit the fœtal head, when applied to the breech to which its curves are not adapted, it is liable to slip off when traction is made, thus endangering the maternal soft parts; and if, with the view to prevent slipping, the handles

are compressed firmly, it has been urged that fracture of the femurs may occur, or that the circulation of the cord may be cut off by the pressure, or that fatal injuries may be inflicted upon the fœtus by the pressure of the points of the forceps upon the abdominal viscera; but with the axis-traction forceps of Tarnier, some of the objections have been very materially diminished. The forceps should never be used until the child has passed the superior strait, and some authors advise not until it is well down upon the floor of the pelvis. In the use of the forceps there should be no exhibition of strength; the tractions are most effective if made during the pains, and gradual and intermittent tractions will soften and dilate the maternal soft parts better than continual hard pulling. They should be aided by simultaneous pressure upon the fundus of the uterus.

If the forceps fail or, if owing to the non-management of the breech, are contraindicated, and an extremity can not be brought down without the employment of force, the next best thing is the fillet. The objections urged to its use are that the fillet might become twisted, or, in getting wet, it might form an uneven band, which, even with care, might cut into the tissues of the child, or that in some cases it causes partial extension of the extremity, and, as a consequence, might slip forward upon the thigh and, in making traction, cause fracture of the thigh bone. But Ollivier suggests that this extension can be prevented by passing the finger into the rectum of the mother, and pressing the breech forward as tractions are made.

The fillet should be passed over the anterior thigh, the tractions should be of moderate force, and should be made only during the pains, and should be sustained by external pressure over the fundus uteri. The fillet can be made of any strong material, but caution should be used in preventing folds, as they are apt to cut into the soft tissues of the child. In the absence of other appliances, or should failure attend the measures already described, it is well to remember that the blunt hook owes its sinister reputation, not so much to its defects as to want of proper caution in its use. It will

not break the femur if adjusted in the groin; it will not produce serious contusions, if the blunt end is carefully guarded by the fingers, and injuries to the maternal tissues can only occur where leverage movements are made. Steady downward tractions made with moderate force and with a hand in the vagina to guard the point of the instrument and to give warning of commencing extension of the thigh will, as a rule, suffice to prevent accident.

No instrument will seize the breech so securely as the cephalotribe. If, therefore, the child is known to be dead, the cephalotribe screwed tightly to the breech can be trusted to act as a reliable tractor.

MANAGEMENT OF THE CORD.

As soon as the cord has passed out of the vagina, traction upon the navel should be avoided by gently pulling the cord downward into one of the recesses until some resistance is experienced. Sometimes the cord is found passed between the child's legs and up over its back. Then traction should be made upon the placental extremity, and an attempt made to slip the loop over the posterior or thigh; but if you fail to do this, and the cord is wound around the child's body, two ligatures should be applied and the cord divided between, and every effort be made to deliver the child as speedily as possible.

LIBERATION OF THE ARMS.

After providing for the safety of the cord, the pelvis of the child should be seized with both hands, and traction made in a downward direction until the shoulder blades make their appearance; then no time should be lost in liberating the arms. If they are folded upon the chest, delivery is an easy matter, but unless the uterus has been kept well contracted down upon the child's head, one or both arms are apt to be extended upwards to the sides of the child's head. In such cases the difficulties in liberating the arms are often very great, owing to the increased amount of space afforded by the curvature of the sacrum. An attempt should be first made to release the posterior arm; this is best accomplished by drawing the body of the

child upward and to the side, causing the posterior shoulder to sink deeper into the pelvis, and furnishing more room for the introduction of the hand; then two fingers should be passed along the side of the child to the elbow joint, which should be pushed across the face, and brought down over the thorax. Pressure should always be made at the elbow joint, and not upon the humerus, otherwise a fracture of the humerus is liable to occur in releasing the anterior arm, as there is rarely space enough between the symphysis and the shoulder to allow the fingers to reach the elbow. It is customary after releasing the posterior arm to rotate the trunk, so as to bring the anterior arm backward into the cavity of the sacrum. This is accomplished by drawing the liberated arm upward, under the symphysispubis. If the back is turned to the left, the arm should be drawn upward along the left labia; and if turned to the right, it should be turned along the right labia. In making artificial rotation, it is well to bear in mind the warning of Dr. Barnes, that the atlas forms with the axis, a rotary joint, so constructed that if the head be rotated beyond a quarter of a circle the articulating surfaces will part, and the spinal cord is compressed or torn; therefore, in making rotation, be sure that the head is rotating with the body. It is well to mention here that the body is always to be kept wrapped in warm napkins until complete expulsion of the child.

EXTRACTION OF THE HEAD.

In the extraction of the head we have to distinguish, first, cases where the head has entered the pelvis, and has only to overcome the resistance of the perineum; second, cases where the head is retained at the pelvic brim by contracted pelvis, stricture of the osuteri, extension of the chin, or insufficient expulsive action of the uterus and abdominal muscles.

EXTRACTION OF THE HEAD AFTER IT HAS ENTERED THE PELVIS.

In Smellie's method, the child is wrapped in warm napkins, and placed astride the operator's arm; the index and middle fingers are passed into the vagina, and placed in the canine fossæ, to the sides

of the child's nose. By this means flexion of the head is induced. At the same time upward pressure is made with the fingers of the other hand, upon the occiput; then by raising the trunk the face is rolled out over the perineum. In case this method fails, we should use the combined method by placing two fingers in the child's mouth, and by traction upon the lower jaw flexion should be accomplished, and with the other hand traction should be made upon the shoulders, and as the head descends the body should be raised, whereby the face sweeps over the perineum. By the combined method, there is obtained the greatest amount of traction force, in combination with the least degree of violence to the child, as the power is exerted chiefly upon the shoulders. The fingers in the mouth are not likely to fracture the jaw.

When the occiput is turned into the hollow of the sacrum, forehead against the symphysis, the process just described should be reversed, as the fingers are forked over the shoulders, the back of the child should rest upon the arm, and with one or two fingers of the other hand the chin should be flexed, and traction made downward, and the forehead rotated under the symphysis.

EXTRACTION WITH THE HEAD AT THE BRIM.

Schroeder, and a considerable portion of the modern German school, employs combined traction upon the shoulders and chin for all emergencies alike, whether the head be high, or after its entrance into the pelvis; however, as the life of the child depends upon the speedy extraction of the head, it is well to become familiar with the different procedures, so that if you fail in one you can resort to the other.

The Prague method consists in seizing the feet with one hand and drawing the body of the child directly downward, the fingers of the other hand are hooked over the shoulders of the child, traction is exerted with both hands simultaneously, and, in the absence of pain, pressure should be made upon the head by an assistant, and after passing the superior strait the procedure should be as described above.

Forceps to the after-coming head has been condemned by some, and warmly approved by others; personally, I have never had any experience with them in any of these troubles, but it is recommended by some authors, in overcoming the resistance of a rigid perineum, in strongly built primiperæ; but it is chiefly indicated when both chin and occiput are arrested at the superior strait. With the chin anterior, the forceps should be applied under the back of the child, and the handles raised so as to bring the occiput into the hollow of the sacrum; with the chin to the rear, the forceps should be applied under the abdomen of the child, and draw the face of the child into the hollow of the sacrum. When the arrest of the head is due to stricture of the osuteri, the forceps will sometimes bring the head rapidly through the cervix, when traction on the feet only serves to drag the uterus to the vulva. In stricture of the cervix great care must be exercised to avoid laceration, as under no circumstances are extensive ruptures of the lower uterine segment more apt to occur than in the forcible extraction of the aftercoming head. The axis-traction forceps are particularly serviceable in these cases.

CIRCULAR LACERATION OF THE CERVIX UTERI.

HUGH CROUSE, M. D.,

VICTORIA, TEXAS.

The parous cervix nearly always shows some signs of laceration. The degree and type vary from the mere indentation to a deep tear, extending to, or into, the vaginal insertion, the type from a unilateral, bilateral, stellate to a circular separation, of the cervical tissue. In meeting the first of the two subsequent circular lacerations I am about to describe, I was totally astonished when specular examination acquainted me with the condition present. The symptoms of cervical lacerations are mainly objective, but yet, subjective indications may be present, when a post-partum hemorrhage of an extent inducing collapse exists, despite a properly retracted uterus. The treatment varies, according to the degree, from a passive inattention to the modern method of immediate repair. The friable condition of the uterine tissues, immediately after delivery, I have found difficult to retain sutures, sufficiently contracting in their efforts, to obtain a fair apposition of the parts; but yet, such an effort should be made. Literature upon the usual types, their nervous sequela and treatment, is appalling in its quantity; upon the circular form the greatest paucity exists. In fact, to such an extent is literature barren upon circular laceration, that I have hesitated to report the two cases noted. The thin-rimmed os, of a slow labor, offers to the rough or hasty accoucheur the best chances for laceration, but yet the scarmarked cervix, presenting its resisting cicatricial tissue to the presenting part, and natural expelling forces, gives its quota of lacerations in the multipara. Case No. 2 is one resulting from, in my opinion, excessive scar tissue left in the closure of the wound, made in a vaginal myomectomy, done at the fourth month. Case No. 1 resulted from the

external force, backed by the proverbial ignorance of a colored midwife, who mistook a pendant cervix, after a twin delivery, in a thirty-six year old, 6 para, colored woman, where but a single placenta existed, for a second after-birth. Her chain of reasoning led her to believe that where two children were, there needs must be a dual placenta. Strenuously she strove, digging and gouging, despite, though plainly found, so the history given the attending physician and I the counsel, no second placenta could be delivered. One of my colleagues had been called, but failed to deliver. On being invited into the case, a careful examination showed an empty uterus, except for clots, instead, a peculiar ribbon of tissue united, to the extent of half an inch at both ends to the cervix (an incomplete band, as it were) presented itself. With proper light and instruments, the parts were exposed and the condition readily shown to be a circular laceration of the cervix. Ten hours had intervened since the delivery of the second child, and, as a result of the dragging, which the band had been subjected to, the parts between attached ends were black and devitalized. The band was removed by means of scissors, the edges sterilized, and antiseptic douches ordered twice a day, with good results.

Case No. 2, Mrs. F., white, age 30, 3 para, had a quick normal delivery, the three stages occupying but four hours. Rather free hemorrhage after placental delivery despite a well-contracted uterus, led to an investigation of the cervix. The posterior lip of the cervix was found to have a circular tear, involving nearly half of the circumference, the breadth of separated tissue being about one-half an inch. The part seemed well supplied with blood, hemorrhage lessening of its own accord rapidly, so a rather snug iodoform gauze packing was applied, and the nurse warned to note carefully the flow. Twelve hours later, the gauze was removed and 1-10,000 bi-chloride douche ordered twice a day; results good. In this case, a vaginal myomectomy had been successfully performed at the fourth month. No doubt the cicatricial tissue had been caught through its excessive resistance to natural forces, and sepa-

ration had been induced by some presenting part. The presentation was L-O-A.

These two cases have been presented on account of the rarity of circular laceration. They are instructive alone from their uniqueness.

WHEN IS IT JUSTIFIABLE TO PREVENT CONCEPTION?

T. J. BELL, M. D.,

TYLER, TEXAS.

The unoccupied pages of medical literature, and the lack of discussion in medical councils, would indicate that this is a matter of only little importance, or at least a question of sentiment, or of morals only. Since the command came to Adam and Eve to "be fruitful and multiply and replenish the earth," man has been very zealous in its observance, and oftentimes, we believe, in flagrant, or at least, ignorant disregard of another law from the Allwise, "thou shalt not kill."

The fact that a man and a woman have had their conjugal relations legalized at the matrimonial altar—and we do not propose to discuss this question outside of the marital relation—we believe should not license them to propagate, indiscriminately, without any regard for the laws of health, as it concerns the husband or the wife, or their child. The burdens resulting from the willful or ignorant neglect of this physical law, we believe, fall most heavily upon the wife and next upon the child. How many loving and lovely women have sacrificed their lives at the altar of their lustful husbands—a willingness at every demand to submit themselves—when they realize that do so so is to jeopardize their lives? I would not be understood as being willing to advocate or advise, or even countenance the willful refusal, without just cause of men and women to bring forth children.

There are doubtless hundreds of women, who, for sentimental reasons, and for reasons begotten of selfishness, rebel against the orthodox method of populating the earth, and by means, one way or another, often dertimental to their health and happiness, prevent conception from month to month and year to year. Evidently God created man male and female for his own glory, and the fact

that the first man and the woman who was given to him for a help-meet, were commanded to multiply and replenish the earth, proves to us that no man or woman, without just cause, may refuse to bear their part in this work of procreation, without insulting God, and bringing upon themselves a just retribution.

In the councils of eternity, "before the morning stars sang together" or "the foundations of the earth were laid," the Allwise planned that the desire of the woman shall be to her husband and they shall beget children, and all to His glory—this pre-arranged plan has never been abrogated, and no man has the right to annul it.

If we may be allowed to speculate upon what would have been man's condition, had our first parents remained in the estate wherein they were created, we can suppose that all the pain and repugnancies of child-bearing would not have been known, for it was not until the fall that God told the woman that He would greatly multiply her sorrow and conception, and in sorrow she should bring forth children. It is apparent then, that the sorrow and pain of child-bearing is a result of that curse incurred by the disobedience of our first parents, and it is with a desire to escape these things that men and women practice all sorts of devices to prevent conception. In the face of all this, there are those who argue that there can no harm result from the persistently repeated intervention of the will of man to set aside a Godgiven law, that he should beget and bring up children. In reply to this, it may be only necessary to say that a law without some kind of penalty for its violation, is no law—in other words, penalty is necessary to the establishment or confirmation of the righteousness of law, so that when men and women violate, or willfully interfere with the righteous operation of this law, they may expect to suffer the penalty. It is not necessary to go into details as to the character of these penalties, or how they may operate, but suffice it to say that few of us are strangers to the various forms of nervous troubles in sterile women, and *that* expression by word and action

of unsatisfied desire for that which by their own misdoings, they have deprived themeslves.

But as has been said, "there are exceptions to all rules," so there may be exemptions from this law, and we believe it is our duty, as physicians, to know when and where the exemption should apply, and give advice accordingly.

The physician is, or should be, the moral custodian of all the physical secrets of his clientelle, and upon him rests the responsibility of the physical welfare of those who entrust themselves to his professional care, and it is no more his privilege to refuse or neglect to give counsel to the husband and wife upon the important matter of conception and its results, than that he may withhold his advice from those who seek it in cases of sickness.

Conception and procreation are, by nature's law, physiological results of the union of the two sexes, and morally that husband and wife, whose household is not blessed with one or more prattling babes, is regarded with suspicion by their neighbors, and sometimes the medical adviser of the family is, in the minds of the people, believed to be a participant in this very unholy infraction. Is it a fact that we are always free from the justness of this charge? Do we always do our duty in these questionable cases? We are advised that the population of some of our sister countries is actually decreasing from the fact that so many of their women remain or become sterile—refusing to become mothers. Is it not a fact that our own Christian land is fast degenerating into this moral prostitution? and that before another century rolls around, we, too, will be following in the wake of beautiful and cultured France.

This, you may say, is too darkly drawing the picture, and these conditions will never be realized in our own America; but, if you please, look around you at the childless homes in our cities and towns, and then answer this question: When is it justifiable to prevent conception? As we have said above, there are exceptions to rules, and exemptions from laws, so we may justly conclude that there are circumstances which will justify prevention of conception. We should fully appreciate the responsibility we assume when we, as

professional men, give advice on this important question, for upon it may hang the material welfare of a fellow-being, and maybe, the destiny of an immortal soul. In answering this question, then, we should ever keep in mind that we are to deal with conditions and not with individuals—not permit our judgment to be swayed by sentiment.

The conditions which will justify the physician in advising a prevention of conception, are perhaps not many, and yet, these conditions, we believe, do exist, and it is just as much our duty to give such advice when the conditions demand it, as it is our duty to produce abortion to save the life of the mother. In women with contracted or distorted pelvis—where the anteroposterior and transverse diameters are out of all proportion to a normal fœtal head, and there is every reason to believe, the woman can not, by the natural channel, deliver her offspring, without any question any man with ordinary sense will advise against pregnancy. In women afflicted with tubercular diseases, particularly pulmonary consumption, especially if they have borne children, and it is discovered that, with each succeeding offspring, the mother is declining in health, we believe the duty of preventing conception in future is imperative.

I recall a picture vividly stamped upon my memory, of a good, sweet woman, who, after her first child was weaned, came to me repeatedly, and implored me, as her physician and friend, to prevent another conception, because, as she said, her mother and sisters had died of consumption, and she knew her health was failing, and that she felt as if to bring another babe into the world would be the sounding her death knell. I treated the matter lightly, but kindly, and permitted her to conceive again, or rather did not advise to prevent it—she, in due course of time, brought her second babe, and died of quick consumption before the child was weaned. The anxiety with which that good Christian mother pleaded with me, with absolute confidence, that I would advise her for the best, and then to see her wasted form, the result, perhaps, of my misdoing, is a picture which can never be effaced from my memory.

This is only one instance of several, that have come under my observation, and I believe that if ayes and nays were here called, the majority in this assembly would declare the affirmative on this question, that in such cases we should advise to prevent conception. Syphilis being yet an unknown quantity, regarded from the standpoint of the bacteriologist, it is yet a mooted question, perhaps, as to how, and in what way, if at all, the disease is communicated to the offspring—whether directly from the father, or indirectly through the mother, who had, previous to conception, become a constitutional syphilitic. However this may be, some of us believe we have more than once seen, and treated, congenital syphilis, as well as afflictions both of body and mind, resulting from inherited syphilis.

If these things are true, is it gracious to permit a woman to go on and bring forth children, when we have every reason to believe they will pine away and die early of this dreadful disease, or if they live longer, will be a menace to society? Until recent years, perhaps, gonorrhea was believed to be a local disease, limited in the female, at most, to the vagina and urinary organs, transitory and harmless in its results, but with increasing knowledge of pathology, and by the aid of the microscope, most deplorable conditions have been found to result from tubular infection by gonococci. The lives of hundreds of women have been jeopardized or made miserable by unsuspecting and unsuspected husbands—men, prior to their marriage, perhaps, who had been thought to be cured, but left, as it were, in a case of chronicity, in the copulatory act, send a straying gonococcus along with the semen, up in the uterus, and being ever on the alert to find a place to lay his weary head, finds the open mouth of a fallopian tube, enters, and although many months of apparent comfort may follow, and the woman give birth to one or more children, a pyosalpinx is the almost sure result. The question may be asked, is it necessary that a woman shall be impregnated in order that the tube may be infected with the gonorrheal poison, or may not a woman have an infected tube without impregnation? In reply, I will venture the suggestion that the great

majority of women, who suffer from gonorrheal pyosalpinx, have, at some time, been pregnant, for the reason that, as we know the mouth of the tube is vulnerable at the time of conception, and more so, perhaps, after the termination of each recurring pregnancy. These things being true, if by any means we may discover that a husband has, at any time, had a chronic gonorrhea, should we not at least give him a very serious caution, and perhaps advise against conception?

Aside from these abnormalities and diseased conditions above mentioned, we find women with chronic Bright's disease, who, if permitted to advance in pregnancy, will likely, at some time, from the sixth to the ninth month, go into eclampsia. I recall one or two instances of this kind, and, notwithstanding my precautions and endeavors to ward off the trouble, in the next pregnancy, the woman had eclamptic convulsions, as she had done before at about the sixth month; I then advised her never to conceive again, and she never did.

The question of preventing conception, perhaps, should be discussed both from a moral and a physical standpoint, and I have not prepared this paper with a view of presenting anything new, but with a purpose to elicit discussion, and thereby gain information, and thus be better prepared in future to do my duty.

May I ever advise husband and wife to prevent conception, and if so, under what circumstances?

DISCUSSION.

DR. J. F. Y. PAINE, Galveston: After remarking that this was a moral question and not one for physicians to settle, no reflecting physician would question for a moment the advisability of preventing conception under certain circumstances, as in cases of tuberculosis, syphilis, deformities of the pelvis and a number of other conditions that need not be mentioned. But I am impressed that this is a matter which should not be regulated by physicians. A law preventing marriage under certain physical, moral and mental conditions would probably be the moral and rational solution of this question. The very thought of this subject is disgusting, and probably the physicians of France are able to explain the alarming decrease of birth rate in that country.

DR. WM. KEILLER, Galveston: I believe that doctors can not conscientiously avoid giving advice on this question. There is no doubt in my mind that there are cases where conception should be prevented. It is nonsense to talk of husband and wife living together and avoiding coitus, and yet it is not right that a consumptive woman, or one suffering from Bright's disease, should be allowed to conceive; nor should men and women with history of insanity in the family beget children. If such people have married they should either separate or use some method to prevent conception. A woman with a contracted pelvis should be delivered at full term by Cæsarian section and her tubes removed. It is time that doctors faced this question and discussed it rationally.

DR. FRANK PASCHAL, San Antonio: The prevention of conception is so far reaching that it concerns our nationality. It is a measure that we certainly should study and give it serious thought. I pointed out the other night that, with the exception of New York, in the Northeastern States—Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island—the death rate exceeded the birth rate of children born of native parentage 1.5 per 1000 of the population; whereas, in the same States, the children born of foreign parentage the birth rate exceeded the death rate about 44 per 1000 of the inhabitants. The tendency to depopulation was becoming so manifest in France, of the native born children of native born parentage, that the French government allows an exemption from taxation for those families that have over a certain number, say five in a family. Now it is astonishing that the birth of children born of native parents in the United States exceeds those of France only two per every thousand of the population.

As to the cause of the prevention of conception. During the year of 1893, when a financial crisis swept over the country and the difficulties that ensued ruined many a home, we find that the birth rate was exceedingly low. Why? Because parents did not care to have children that they were not able to take care of and support. After the crisis passed the birth rate commenced to increase. If this low birth rate of children born of native parents keeps on in the United States, mark what I tell you, in those Northern States native children of native born parents in a few years will be greatly in the minority, and you will have a population of children born of foreign parentage. This does not apply to the laboring classes alone; if it did, it would be bad enough, but it is the better classes that we should be anxious about, the men and women who are intelligent, who have brains and wealth; they are the kind that are preventing children from coming into the world and who are keeping from this great country of ours those who in time would become intelligent American citizens.

In the South it is different. Here the birth rate exceeds the death rate

of those born of native parentage 21 per 1000 of the population, and those children of foreign parentage 27 per 1000. As I stated the other night, it means that the South will furnish the North with children born of native parents. From a scientific standpoint, there may be cases in which prevention of conception is justifiable. I do not believe that such cases will happen once in thousands of times; yet how often have we been approached by young men, on the eve of marriage, asking us if there is not some way in which their wives can be prevented from having children; that they are not prepared to have children just now. It is certainly abhorent to the medical man that he must listen to a young man, on the eve of his marriage, asking to aid in preventing the propagation of our race, and that we must tell him the purpose for which he was created.

It behooves us, as medical men, to study this matter and educate the public to the evil of the prevention of conception, and try to prevent American born children of American parentage from being supplanted by children born of foreign parentage.

DR. CHAS. WARDELL STILES, M. H. S.: The statistics which Dr. Paschal has given are exceedingly interesting, but it is not clear to me that his application of the figures to the case at hand is entirely free from objection. It seems to me that he has not taken into consideration the fact that many people from New England have emigrated to the West and South, nor has he shown that it is not these emigrants who have had an important influence in the higher birth rate of the sections in question.

The point has been advanced that in preventing conception we are dealing with a moral question, but the term "moral" has not been defined. Should we not take a broad view of "morality" in this matter and say that anything is "moral" which tends to elevate the race? In other words, should we not consider quality as well as quantity? I should incline to the view that whenever it is for the benefit of the American race to prevent conception it is moral to do so. We can not always prevent marriage in those cases where we think marriage might be detrimental to the race; but where conception, as a result of such marriages, would lead to a deterioration of the race, I think we are justified in such prevention.

Again, I find it difficult to look upon women as preordained to be machine-incubators, and it is difficult for me to escape the conclusion that it is better for a woman to bring only two children into the world and to train them up to be good citizens, than it is to give birth to ten or twenty children and then die and leave the children without a mother's influence.

DR. JOHN T. MOORE, Galveston: I agree with Dr. Paine, that it is a moral question, but we can not dismiss it with that statement. While it is a moral question, it is a question that we are called upon every day to

confront. Dr. Paschal has referred to young men just on the eve of marriage coming to you and asking if conception can not be prevented; healthy men and healthy women in whom it should be their heart's desire to have children—it ought to be their pleasure to look forward to their coming as the best thing in their lives. And yet, we are asked in a matter of confidence if there is not some means of prevention. Just the day before I left home a young man came into my office and said he was about to marry and he had decided not to have any children at first, but to wait a convenient period and then they would have them. Now, these are questions of the most vital importance, and the idea of people being so far degenerated as to want to prevent conception when they ought to be glad that they could bear children.

There is no doubt that this is a moral question, but we can not simply say it is a moral question and dismiss it; we have to face it and take it up, and who is more fitted than the physician? These are questions upon which the people at large are unacquainted. As our boys and girls grow up they should be taught what is right in the married relationship. To whom shall we turn for this advice but to the conscientious and moral physician? Dr. Paschal has hinted at the whole solution. It seems to me that we, as physicians, must impress upon the people that as fathers and mothers of the country they are to educate their boys and girls along these lines; make them understand what these functions are. Who is to give the proper instruction but the physician? Do not let them go to the man around town who says he knows all about these matters relating to prevention of conception. The most injurious methods are practiced; methods that drive the wife from the husband. This question is so absolutely delicate that we, as doctors, keep out of it; yet it is a most important question for the consideration of the physician today. The methods practiced lie at the bottom and are responsible for a large number of nervous diseases from which the American people suffer today. We have to meet these issues. The time to begin their consideration is with the boys as soon as they have arrived at an age to understand these functions. They must know for what they were intended. They should receive the most careful and intelligent instruction from persons who are fitted to give it. We must educate them that they may be fit to marry.

I certainly am glad that Dr. Bell has presented this subject, and I certainly hope that we, as physicians, will enter into it with the desire to do what we can to contribute to its solution.

DR. J. C. LOGGINS, Ennis: I think that they have all taken a wrong view of the question or of Dr. Bell's paper. I take it that from the way he framed his title it was not what to do, but when we are justified in preventing conception. I take it that he means to call our attention to the

fact when do we consider it wise, and if we can give reasons why we attempt it. I think we should ask them the object for which they seek such interference, and should not hesitate to talk to them candidly. These questions and conditions often come before us as medical men, and if we do not answer with candor, and we think that there are conditions present that the bearing of children is unwise, we should give them the benefit of our opinion; and in such cases as were referred to by Dr. Paschal they should be made to feel ashamed of the enormity to contemplate any such conduct. It is perhaps right that this question should be carried out a little further than it was by Dr. Keiller. But the questions that should be discussed by the medical men of this country are whether people, in view of the question as presented by Dr. Paschal, should be thoroughly informed as to the condition to be visited upon our Union. That they should not shirk the duty for which they were created; we should educate the people along these lines; we should treat the questions with candor and fairness as they present themselves. We should not shirk our duty. These are questions which come before us as medical men, and the American people have the right to our intelligent advice and to know that we will not give them wrong ideas of duty. I am heartily glad that Dr. Bell has called the attention of the profession to this question as a medical question, in the light of what Dr. Paschal has said that is threatening our national integrity.

DR. G. H. MOODY, San Antonio: We are sometimes justified in advising prevention of conception, e. g., when there is a well-marked neurotic tendency, because we want the procreation of strong men and women.

We often see married people who have no children, where it seems to be the result of nature's effort toward final elimination of that line of tendencies, which, if allowed to continue, would lead to a degeneracy that would leave to posterity many unfortunates.

Society tries sometimes to establish standards of its own, which would not be good for the human family. As physicians, we should raise our voices against standards out of harmony with nature. Some churches prohibit the granting of divorces. People are often fortunate who get divorced; the earlier they do so the better. Sometimes their union is unfortunate, and to bind them for life is irrational. In such cases there ought to be means to get divorces, and get them early. The time is coming when there will be legal steps to prevent plainly unwise marriages.

DR. BELL, in closing, said: I wish to say that I realized what I was going to hear when I prepared this paper, and have presented it solely with a view of having just what we have had here—the pro and con of this question. The only point that I wish to make is in replying to the different doctors who took part in the discussion.

I believe the question as Dr. Paine puts it as being a moral one and then leaves it is a mistake. I believe that the proposition that this is a question which should be left to the laity to decide is an erroneous one, and this question is not wholly a moral one. I think in what Dr. Paschal said, if I am not mistaken, he spoke along that line.

Gentlemen, I take it that these are physical questions that devolve on us to decide. This question concerns the family; we must face it; we can not push it aside and say the question is settled; we must settle these matters.

No man on this floor is more unwilling than I am to violate the laws of my fellowman or my God or moral or physical law. The question is, whether it is our duty, as physicians, to advise individuals, under certain circumstances or conditions, to prevent conception; and as the gentleman has suggested, it is not wholly a moral question when a case comes before us to decide or advise under what conditions the woman may prevent it. It is not how it should be done—that is entirely outside of this question—and, as Dr. Keiller has said, I hope some doctor will in future discuss it as to the question of how to prevent conception—if we have a right to interfere or to advise interference; how and what are the best means, the most harmless means by which to have it done. I live in a local option county. If a man should come into my office and say, "Doctor, I want a prescription for whisky," I say I can not give it to you; but when a man comes to me and says: "My wife is sick," and gives certain symptoms that impress me that he needs it, I give the prescription; and if a man comes to me and says: "My wife and I have enough children; give her something to prevent conception," I can not do it; or if a man comes to me to prevent his wife from having children, that, to my mind, is a moral question, and I have no right to interfere when it is only a question as to how many children they have. I never shall forget the poor little woman who came to me and said the history of her family was tubercular and did not want to conceive again, and because I did not advise her how to prevent conception, I think I did an irreparable injury to that woman and one that I shall regret the rest of my life; it will stay in my mind as a wrong that I have done to that good woman.

OTITIS MEDIA FROM THE STANDPOINT OF THE GENERAL PRACTITIONER.

E. E. GUINN, M. D.,

JACKSONVILLE, TEXAS.

It is not my intention to make it appear that there is a difference of opinion between the general practitioner and the specialist in regard to the etiology, pathology, diagnosis, treatment and prognosis of middle ear disease, except it be that the general practitioner, according to my observation, does not appreciate the gravity of the situation as does the specialist. Therefore, the object of this paper is not to instruct the general profession in the management of this malady, but to impress upon them the importance of looking upon earache as being far more serious than is generally supposed. In fact, an acute naso-pharyngitis should be a note of warning to the family physician; and, in fact, all acute pathological conditions that are prone to result in middle ear disease.

It really seems to me that middle ear disease should be regarded as symptomatic and not a disease itself, because it invariably follows some acute or chronic disease, unless it be congenital, which is the exception and not the rule. With proper attention from the family physician to these acute and chronic conditions a great majority of mastoid abscesses, permanent deafness, idiotic expressions of the face, chronic catarrhal troubles, and a great chain of symptoms and conditions, so often observed in youths and adults, who have in their childhood suffered from middle ear disease, could be prevented.

It, therefore, appears to me that if the family physician is not competent to treat these conditions, he should at least be able to recognize and refer them to some competent specialist or general practitioner who can treat them; if not he is certainly responsible for the condition which follows. And, by the w[illegible]ly

apply to the ear, but to the nose, throat and eye as well; and it would be wise also to include surgical troubles.

It is the duty of every physician, if he is not competent himself to treat a special condition, to refer said patient to some one who is; if not, this physician is surely responsible for the result. There should be a warmer fraternal tie between the real physician and real specialist, for certainly we can not all be real specialists, and some are not real physicians. And the people and the real physician and specialist should unite and eradicate from the State every vestige of the quacks and charlatans, whose mission it is to propagate poverty, false teachings, human suffering and destruction of life. And this condition does not prevail only amongst the ignorant and poor, but in the homes of the rich and the educated. For proof of this assertion, permit me to call your attention to the action of the Twenty-eighth Legislature on the so-called "Drugless Doctor Bill."

Otitis media is due to many causes, perhaps the most frequent being naso-pharyngitis—generally an acute cold. The naso-pharynx is highly vascular and contains much glandular tissue, lying between the pharyngeal mouths of the two eustachian tubes. The pharyngeal tonsil, as you know, is there situated. During an acute coryza and other throat troubles these tissues become engorged, congested and inflamed, and all become abnormally active under these conditions, and from the pressure exerted by these tissues the eustachian tube or tubes are closed. Aeration of the drum cavity is interrupted, a vacuum is formed, an exudation of serum takes place, pressure in the tympanic cavity follows with bulging of the membranic tympani and earache; but before this condition of bulging of the drum membrane takes place it first retracts, by the vacuum of the drum cavity and the external air pressure upon the drum; hence we may have earache. If left alone, or improperly treated with oils and various other harmful agents (which is usually the case), then the bulging comes on, and if the drum does not spontaneously rupture, cell proliferation takes place, followed by microbic infection; and pus formation, eventually the process of

necrosis, comes on, followed by sloughing and evacuation, and a chronic otitis media, and perhaps permanent deafness.

Otitis media from other causes generally goes through the same process, except perhaps it be in the cases due to specific and direct infections, such as scarlet fever, diphtheria, etc.

The diagnosis is generally easy; most every mother has made a diagonsis of earache before the physician has been called. If an exudation in the drum cavity has taken place it is said that a correct diagnosis is easily made by allowing the child to become quiet, and then with your finger's tip make pressure upon the tragus. If the child is suffering from earache it will cry. This, however, I do not consider pathognomonic, as most children have a mortal fear of the physician, and will cry out if you touch them anywhere; therefore, it is best to carefully get a history of the case, the probable exposure to cold, or dampness, whether it has an acute cold or sore throat. If the child is picking at its ear, this will strengthen your diagnosis; however, it may be necessary, in some cases, to search closely for symptoms before a definite diagnosis can be made. You may resort to an inspection of the drum membrane, which is difficult in many cases. After the diagnosis has been made we begin our treatment.

First the pain should be relieved. If in the acute stage of effusion, this can usually be accomplished in twenty to thirty minutes by the instillation into the ear of five or six drops of carbolized gylcerine (one-half per cent); if not relieved within this time (twenty or thirty minutes) it should be repeated; or, better still, use a properly made tampon of absorbent cotton or wool, saturated in the above solution. This tampon should be gently, but surely, placed against the drum, and renewed as required; but in this stage, with proper treatment to the pharynx and eustachian tubes, this condition rarely calls for a repetition of the tampon. The initial tampon should be left over night or day, as the case may be. The glycerine removes the effusion and the carbolic acid has an anesthetic and antiseptic influence.

The treatment of the throat should be cleansing with most any of the alkaline preparations on the market, followed, perhaps, with some stimulating spray atomization. It is important to open up the eustachian tube and aerate the drum cavity. In an infant this is easily done with a Politzer's bag, and it is not necessary for the infant to swallow water or other fluids to accomplish the desired result, as it will always cry. This act does away with the necessity of the water. In larger children, that will coöperate with you, the water can be used, or the compressed air and the eustachian tube. In the condition called chronic dry catarrh it will be necessary to repeat this catheterization of the tubes about twice or thrice per week. This treatment can and ought to be augmented with galvanism, by using a fine gold wire electrode, introduced into the eustachian tube through a hard rubber catheter attached to the negative pole, with the other pole held in the hand of the patient. Use one to five milliamperes three to five minutes twice or three times per week. Constitutional treatment should not be neglected, when indicated. If the child is not seen in the first stage, and pus has formed in the drum cavity, an incision in the membrani timpani should be made and free drainage instituted. While I hardly approve of the various irrigations, it may be necessary in some cases to resort to such procedures. For this purpose perhaps there is nothing better than sterile hot water, followed by ten to fifteen drops of equal parts of a solution of bichloride of mercury (1 to 10,000) and alcohol dropped into the ear. Then insert a gauze drain. This I believe the most important step in the treatment of chronic discharging otitis media, and will cure most cases. Cotton is easier to use than gauze, and is as effectual.

Cocainize the canal and wrap (loosely) on a suitable probe a small amount of lint, introduce this through the perforation into the drum cavity. Now, after a gentle twist of the probe, it is withdrawn. The cotton is left. Renew this every four to twelve hours, according to the discharge. Give the eustachian tube proper treatment; look after the ventilation and hygiene; give the patient the

best concentrated foods; regulate the bowels. Proper tonic treatment should be given.

There are complications to many cases of middle ear disease, which I shall not speak of; however, with proper treatment in the acute stage, the complications will be the exception.

COW'S MILK; ITS USE AND CARE IN INFANT FEEDING.

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The question of cow's milk, its care and use in infant feeding, is one that occasions more or less difficulty to the average practitioner. In successful infant feeding it is not only necessary to have an accurate knowledge of the composition of the food being used, but also the food for which it is being substituted.

There is no end to the number of widely advertised "perfect substitutes for mother's milk," but the mainstay of successful bottle-feeding is good cow's milk.

MILK.

Definition.—Milk is an opaque, yellowish-white fluid, with a slight alkaline reaction and a faintly sweetish taste. It is the secretion of the mammary glands, in which it is produced by certain processes of diffusion from the blood, accompanied by a dissolution of the gland cells.

Lactation commences a few days after birth, and lasts for a period of time, the length of which depends on various circumstances. C. Von Voit says: "Milk consists of liquid cells." All animals are, therefore, carnivoræ, for they sustain themselves by consuming a portion of the body of their mother.

The substances composing milk are for all mammals essentially the same. So is the general character of the milks. The difference in the various milks consists, therefore, only in the respective quantities in which the constituents are present, as also in taste, flavor and color.

HUMAN MILK.

It has been presumed that all human milk conforms to a defi-

nite standard, and so it does, but only to the extent of its chemical composition. The respective quantities in which the constituents are present, are only more or less constant, as it is a well known fact that a baby will thrive on one woman's milk and not on another. We know that the relative composition of milk varies from time to time during the day and even from minute to minute during a single nursing. It is influenced by the health of the woman, by menstruation, pregnancy, excessive lactation, and the like. It is quite evident then, that it is not possible for us to obtain a perfect substitute for mother's milk, and that substitute feeding of infants should only be resorted to when the breastfeeding is no longer possible.

From a series of analyses of human milk, made by Prof. Albert H. Leeds, the following was given as an approximate average: The reaction persistently alkaline; specific gravity, 1031.3; bacteria, absent; fats, 4.13 per cent; lactose, 7 per cent; albuminoids, 2.0 per cent; ash, 0.2 per cent. Total solids, 13.33 per cent. Water, 86.67 per cent.

Giving a nursing woman an excess of nitrogenous food does not increase the albuminoid elements of her milk nearly so much as it does the fats, while giving her fatty or rich food in excess does not increase the cream or other ingredients of her milk. It may, indeed, diminish them by disordering her digestion. The nursing-mother's diet must, therefore, be plain but substantial, especially in regard to animal food.

COW'S MILK.

This is typical of all milks, and as it is the only milk in this country that has a commercial value, and can be obtained in every market, our discussions will have reference to it alone as a substitute for woman's. In various other countries, milk from the goat, mare and ewe is considerably used, not only as food, but for the manufacture of various products. Indeed, the peculiarities of some of these is supposed to be largely due to their having been made from the milk of animals other than the cow. Koumiss, made from

mare's milk, in Arabia and Roquefort cheese, made largely from ewe's milk, are noteworthy examples.

Cow's milk differs much in quality, according to the breed and condition of the animal, quality of its food and care bestowed upon feeding and hygienic surroundings. The chief variation concerns the quantity of cream produced.

The milk of Jersey and Guernsey cows has more proteids and fats than the long horns. Individual cows are apt to vary among themselves from day to day in quality of their milk, and therefore notwithstanding the general belief, it is a disadvantage to feed an infant always upon the milk of the same cow. More uniformity will, on the average, be secured by feeding the mixed milk of several animals, the variations in the components neutralizing each other.

Professor Leeds gives the following as an average from a series of analyses of cow's milk: Reaction, feebly acid; specific gravity, 1029.7; bacteria, always present; fats, 3.75 per cent; lactose, 4.42 per cent; albuminoids, 3.76 per cent; ash, 0.68 per cent. Total solids, 12.61 per cent. Water 87.39 per cent.

From the above comparative analysis, it will be seen that the human milk differs from cow's milk in several important particulars. For this reason it becomes necessary, when infants are fed upon the latter, to so modify it as to render it more digestible for them.

The important differences between human and cow's milk are that woman's milk is sweeter by one-third, and contains little more than half as much casein. As the calf grows faster and has to manufacture more beef than the baby, it needs more albumin for tissue building. The casein of mother's milk, moreover, forms smaller coagula, both with rennet and in the stomach, which are more easily dissolved. The normal reaction of human milk is alkaline. Cow's milk varies from faintly alkaline to neutral. There is nearly one-half per cent more fat and the globules exist in a finer emulsion in woman's than in cow's milk. Cow's milk appears richer, white and more opaque than human milk.

The results obtained in bottle-feeding are so dependent upon the milk being of the very best quality, that it is important for the physician to know how this can be secured. To be successful in infant feeding, is to be a close observer of details.

Pure as cow's milk may be in its natural state, it is very perishable when neglected, though with proper knowledge of its peculiarities and care in its keeping, it can be held in a wholesome state from five to ten days. Nevertheless, there are natural changes which are sure to occur as soon as opportunity is given.

Thunder storms, impurities, warm temperature, and other conditions known to exist when milk is more liable to give trouble, have been blamed for its changes, But it is now known that these are only indirect causes, and that the changes in milk which bother the housekeeper are due to and can not take place without the presence of bacteria.

To obtain good milk, the cows should be cared for very much the same as horses; the udders and sides wiped off with a damp cloth just before milking. Let the milking be done with clean, dry hands, into a clean pail, held close to the udder. The first stream or two from each teat should be thrown away, and not allowed to get into the pail, for during intervals between milking, bacteria from the air get into the cow's teats and grow with wonderful rapidity. By throwing away the first few streams, at the beginning of milking, these are disposed of. If the sides of the cow are plastered with dirt and manure, as is often the case, a certain amount is sure to fall into the pail of milk. This is where the trouble really begins, for this dirt and manure abound in bacteria. Over two hundred species of bacteria have been found in milk, about twenty of which produce lactic acid. Other species produce ropy, slimy, blue and red milk, also alkaline products.

These bacteria themselves are practically harmless, but the products of the growth may seriously affect the healthfulness of milk. Pathogenic bacteria are occasionally found in milk, but they get there almost invariably through the water used in washing the milk cans or bottles, or from the skin or secretions of some infected

attendant. Tubercle bacilli are found in milk from cows with tuberculous udders, but the danger of infecting human beings is thought to be greatly over-rated. Tubercle bacilli do not grow in milk.

As soon as each cow is milked, the milk should be run through an aerator and cooler, in a room free from bad odor or tobacco smoke, and then kept as cool as possible until used. It is obvious that cows should be stabled in clean, well ventilated barns. These conditions should be possible everywhere, and if the physicians will insist upon their observance on the part of dairymen, the problem of a proper milk supply will be largely solved.

The prompt and rapid aeration and cooling of milk are matters of importance.

The temperature at which bacteria in milk grow most rapidly is that near body heat. There is practically no growth when the temperature is below 50° F. It has been shown that bacteria, which increased 200 fold in four hours at 93° F., increased only eight fold at 55° F. So the necessity of cooling the milk immediately after milking will be apparent.

Combined aerators, strainers and coolers, suitable for use, with well water or ice water, can be had at any dairy supply house at a small cost. By using one of these the cow odor, animal heat and most of the dirt can be removed from milk in a few minutes. The milk of a herd of cows can then be mixed and bottled or canned and packed in ice, or, as is often done, lowered into a well or set in a cool spring. Such milk will keep well, while milk "warm from the cows" soon spoils.

It should also be borne in mind that the milk can be contaminated as easily after delivering to the family or consumer as before, and too often a milkman is blamed for bad milk or cream when it was made so by conditions over which he had no control. If milk is left where dust can settle in it or flies have access to it, or if set in an ill ventilated refrigerator or in a warm place, it is pretty certain to be in a bad condition after a few hours, no matter how good it was when delivered.

Numerous well authenticated cases are known where customers have complained of milk received and upon investigation it has been found that servants in the house tampered with the milk, removing cream for their own use or adding old milk or vinegar to make it sour prematurely. The object of the latter act was in collusion with an outsider, who supplied the motive to cause the buyer to change to some other dealer whom the servant was ready to recommend.

Attention on the part of the physician and customers to the proper way of producing and handling milk would result in a great improvement of this most important food. Laws will do much to prevent fraud, but customers who know exactly what they want, how to get it, and how to care for it, have a much greater effect on milk producers and dealers than any possible laws.

Among workers in artificial feeding of infants of late years, pasteurization and sterilization have had many advocates. This is shown to be not only unnecessary and ineffective in its object, but destructive of the nutritive value of milk as a food. As the advantages claimed for pasteurization and sterilization are only to overcome the growth of bacterial life, why direct our attention toward correcting an evil that, with our present knowledge of milk, we know we can prevent from occurring? We know that the pasteurization has no effect upon bacteria existing in butter or rich milk, and that the presence of $\frac{1}{8}$ of 1 per cent of the lactic acid prevents pasteurization from having any effect upon bacterial life. The objection to sterilization is that at high temperatures the albuminoids of milk are coagulated, their nutritive value destroyed and are rendered less digestible, and yet fails to destroy and leave the toxin already manufactured by bacteria unchanged. The only sure method of destroying bacteria in any organic compound is tyndalization. That is continuous sterilization, the substance being heated several times to a degree of temperature that will kill bacteria. It has also been shown that where sterilization of milk is carried on to any extent that too much dependence is put upon the

sterilization, and too little attention given to the producing of milk as clean as might otherwise be done.

The increase of scurvy of late years has been directly attributed to the more general use of sterilized milk. Of the 379 cases collected by the American Pediatric Association, 107 occurred in children fed on sterilized milk. Out of the 32 cases which I collected while resident physician of the New York Infant Asylum, 87 per cent were fed upon some form of cooked food, either sterilized milk, condensed milk, or one of the numerous prepared foods. The remainder I was given to understand ate whatever they could manage to get hold of. I have also noticed a predisposition to rickets in children fed upon cooked food.

It is evident then to the physician that in selecting cow's milk for infant feeding, that which is clean, aerated, cool and preferably bottled immediately after milking, and kept below 60° F. until delivered, is the article to be chosen. Very little disturbance of digestion is caused by the average breast milk, but when it comes to bottle-feeding the trouble often appears, and here the physician has an opportunity to show his knowledge of dietetics.

The infant that can not take properly-prepared cow's milk is very rare. The trouble often comes from inability of the physician to properly modify the milk so as to make it suitable for the case in hand. It is impossible to lay down fixed rules for infant feeding, as each case must be treated by itself, but there are certain underlying principles involved, which, if understood, would greatly simplify the problem.

The profession is indebted to Dr. Rotch, of Boston, for first having taught a systematized procedure for the modification of milk; to Dr. Henry D. Chapin, of New York, for supplying the method so that it is practical for home use. It is based upon the principle that in woman's milk the fat is usually between 4 and 5 per cent, twice as much as the proteoids (curds), which vary from 2 to 2½ per cent; while the sugar is between 6 and 7 per cent. As has been shown that the average market milk will contain from 3 to 4½ per cent butter fat, while the proteoids average about 4 per cent and the

sugar from 4 to 5 per cent, it is pretty well settled that in mixed cow's milk the proteoids about equal the fat when the fat does not exceed 2 5-10 per cent. When the fat in the whole milk is above 4 5-10 per cent, the proteoids are a little less than the fat.

While in most cases a medium grade of milk will be supplied in towns and cities, still we must be prepared to properly modify either the very rich or very poor milk. An easy way of calculating percentage is to take advantage of the process known in the dairy industry as the deep-setting process of creaming. This consists in putting milk into tall, narrow vessels and cooling to about 40° F. for about twelve hours. At the end of that time all the fat of the milk will be found in the cream layers; the remaining milk often contains no more than 0.2 to 0.5 per cent. The cream in the neck of a quart bottle, after being cooled and let stand for twelve hours, should be between three and four inches deep, measuring from the top, or about six fluid ounces. The line separating the cream from the remaining milk is distinct. Unless the cream layer is distinct when the milk is delivered, it is probable that it has not been properly cooled, or the bottling has been done at the place of delivery, and not at the dairy. Not only is the proper creaming thus interfered with, but the chances for contamination are increased.

In conformance with nature, it is apparent that human milk should be the basis upon which the infant feeding should be founded. The next important step then is to get the cow's milk as nearly as possible in the same physical condition as mother's milk. The diluent that I have seen the best results from is a wheat, barley or oatmeal gruel, the starch of which has been digested or dextrinized by the action of diastase. A heaping tablespoonful of flour made from a cereal is boiled with about a pint and a half of water for fifteen minutes. It is then removed from the stove and set in cold water for about three minutes to cool it. When it is sufficiently cool to taste, a teaspoonful of a preparation of diastase is added, which renders the gruel thin and watery. This makes about a pint of gruel, containing the starches in soluble form, while the celluose or skeleton of the cereal acts as a most effective

attenuant of the curd. These digested gruels render the milk curds porous and also provoke the secretion of the digested juices. As diluents, they are a very great improvement on water. Most of the thick malt extracts are sufficiently active in diastase to produce the desired effect. I, however, prefer the employment of diastase itself without any of the other malt ingredients, as being both speedy and efficient. It can either be produced cheaply at home or purchased at the nearest drug store. A simple decoction of diastase may be made as follows: A tablespoonful of malted barley grain put in a cup and enough cold water added to cover it, usually two tablespoonfuls, as the malt quickly absorbs some of the water. This is prepared in the evening and placed in the refrigerator over night. In the morning the water, looking like thin tea, is removed by a spoon or strained off, and is ready for use. About a tablespoonful of this solution can be thus procured and is very active in diastase. It is sufficient to dextrinize a pint of gruel in ten to fifteen minutes. Preparations of diastase are made by a number of chemists, Parke, Davis & Co., Forbs, Horlick and others.

There are cases constantly arising where milk must be withheld for a time or given only in small quantities. Here is where the judgment of the physician is put to a test. The symptoms that call for modification or change of diet are loss in weight, vomiting, colic and unnatural stools. A brief glance at these conditions may be helpful to some in applying dietetic remedies.

Weight.—The weight of the infant is the best means we have to measure its nutrition. It is as valuable a guide to the physician in infant feeding as is the temperature in a case of continued fever. Although the weight is not to be taken as the only guide to the child's condition, it is of such importance that we can not afford to dispense with it during the first two years. It is a great advantage to keep up regular observations during childhood. A child may not always gain rapidly, but it should gain steadily, and if it does not, something is wrong. All the conditions surrounding the infant should be investigated, but especially the food. One should

not be satisfied unless the average weekly gain during the first six months is at least four ounces.

Vomiting.—When vomiting occurs immediately after feeding, it is probably caused by simple distension of the stomach, and less bulk of food is accordingly indicated. The vomiting that occurs some time after feeding is apt to be caused by undigested food, the rejections are frequently highly acid, and there may be curds and mucus present. Projectile vomiting, where food is rejected with force, is an indication of brain irritation.

Colic.—Colic may be caused by cold, but is more frequently induced by the fermentation of indigestible food.

Conditions of the Stool.—Much may be learned by a careful inspection of the stool with reference to increasing or diminishing the various kinds of food. The normal stool is smooth, yellow, homogeneous, and about the consistency of thin mush. The following may be considered abnormal types:

Green Stools.—Stools can only be considered green when that condition is evidenced immediately upon their passage. They are due to fermentation, which is doubtless a bacterial action. All stools become green a certain time after passage, caused by oxidation of the air.

Curdy Stools.—Curdy lumps may be procured by undigested casein or fat. The former are hard and yellowish, while the latter are soft and smooth, like butter.

Slimy Stools.—These are the result of catarrhal inflammation. When the mucus is mixed with the fecal matter, the irritation is high up in the bowels, but when flakes or masses of mucus are passed, the trouble is near the outlet.

Yellow, Watery Stools.—These are seen in depressed nervous conditions, especially in the hot days of summer, when the bowel is relaxed and the inhibitory fibers of the splanchnic nerve do not act to advantage.

Very Foul Stools.—These are caused by decomposition of the albuminoid principles of the food.

Profuse, Colorless, Watery Stools—With a little fecal matter, are

doubtless caused by an infective germ akin to Asiatic cholera. This is known as cholera infantum. It is rare to see one of these types by itself, with the exception of the last; they may be seen in all combinations.

In slight forms of unnatural stools, increase the dilution of the top milk and reduce the quantity of sugar a little. If large lumps of fat are in the stools, use milk containing less fat for diluting. This can be obtained by taking more top milk out of the quart bottle. Where lumps of casein are apparent, the diluent must be increased. If increasing the dilution and reducing the fat and sugar does not overcome the trouble, stop the milk and feed dextrinized gruel for a day, gradually adding a little milk, which is increased in amount as fast as the infant can digest it.

There are times when infants can not digest milk in any form, no matter how much it may be diluted nor what diluent is employed. They may be given mutton broth, from which the fat has been removed, extracted beef blood and water, dextrinized wheat or barley gruel, or dextrinized gruel, to which either the white or yolk of an egg has been added.

SOME THOUGHTS ON THE FIRST STAGE OF LABOR.

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Without going into a discussion of any of the causes or supposed causes of labor, or why pregnancy should end at or near the end of the tenth lunar month, it is my desire to present a few thoughts that seem to me to be worthy of our careful attention.

When called to see a patient who thinks she is in labor the first duty of the accoucheur is to find whether or not this is true. This is not always easy, and can not be accomplished in every case by a hasty examination of the mouth of the womb through the vagina.

The first thing to be done is to gain the confidence of the patient and convince her that you have a deep interest in her case. Get a history of her case from the beginning of the pregnancy; let her tell you the exact date of her last menstrual period, if she can remember it. Count the time and see if it is time for normal labor to come on. The best rule for me to remember is to take the date of the beginning of the last menstruation, count back three months, then add seven days and you have her exact time to be confined.

The obstetrician should now wash his hands and the vulva of the patient with soap and hot water, rinse them with listerine or a solution of bichloride of mercury—1-2000—and then make a digital examination of the mouth of the womb to see if she is really in labor; if so, how far advanced the dilatation is. At this examination he should determine, if possible, the exact presentation and position of the child so that it will not be necessary to examine again until the membranes rupture.

At this visit the abdomen should be palpated externally, the fœtal heart listened for, and everything possible found out that would be of advantage in her delivery. If she is yet to be several hours in

this stage, the bowels should be moved by an enema, and if not convenient to a bath tub at least a hip bath should be given, after which an antiseptic dressing should be applied to the vulva, held in place by a T bandage.

If the pain is severe, ten grains of chloral hydrate should be given, and another dose of five grains in thirty minutes if the first dose does not procure sleep and relief for the patient. After watching for the effects of the medicine, if the relief is sufficient, the physician may go on making his other calls, instructing the patient to empty the bladder when she desires, that she may sit up or walk about the room if she feels like it, always leaving word where he can be found when wanted on short notice. Instruct the patient that she shall not bear down with the abdominal muscles during the first stage of labor; that it does not hasten the termination of the labor, and may do a great deal of damage to the neck of the womb by jamming it down into the bony pelvis before it is sufficiently dilated.

What I have detailed above is necessary in a perfectly normal case of labor if found before the second stage has been reached. If there are abnormalities, the earlier they are discoverd and properly cared for the better for all concerned. It is in the first stage that version should be practiced if necessary; in fact, if the second stage has set in before it is attempted, it will be found very difficult to perform and much more hazardous, both to mother and child. During this stage all the preparations should be made for the second and third stages, from the proper arrangement of the instruments to be used, bed for the patient, anesthetic and even the making of a string to tie the cord with.

While I have not tried to mention all that might be said or done during the first stage of labor, I have tried to show that there is plenty to be done to show a proper interest in any case without making frequent digital examinations of the womb, a practice that can not be too strongly condemned.

The real object of this paper is to call attention to what I consider one of the most pernicious practices that a physician could be guilty of: that of hurrying a patient into the second stage of labor

before the mouth of the womb is sufficiently dilated to allow the child to pass. It is true that the first stage of labor can be shortened by inserting the fingers into the mouth of the womb and instructing the patient to bear down with the abdominal muscles, but the second stage will be correspondingly lengthened and the danger to both mother and child increased. To be constantly tugging at the anterior lip of the cervix for the purpose of saving time or appearing to do something for your patient is inexcusable; besides, as a result, you will see a bruised and torn cervix—the most prolific cause of sub-involution, displacement and disease of the uterus in women who have borne children.

It is, or should be, at the close of the first or beginning of the second stage that the cervix slips over the head of the child, but this may be delayed until the head is almost ready to pass over the perineum. If in any case it becomes necessary to dilate the cervix, do it as nearly as possible like nature herself would do it, from above downward, by thoroughly cleansing and oiling the hand, introduce it into the uterus, close the hand so that the fist will become almost as large as the head of the child; now make gentle traction during the pains as the fist passes out, making ample room for the head of the child to follow. This will effectually do what you have failed to do by rupturing the membranes and trying to dilate from below with the fingers.

Tears in the cervix are much more detrimental to the health of a woman than partial rupture of the perineum. You may look for such tears in the long axis of the head of the child; that is, if the child is in the first position, you may expect the tears in the left side of the cervix if it be unilateral, and the opposite if the child is in the second position.

The membranes should never be ruptured until ready for the second stage of labor, because, if they remain intact, the head of the child will recede as soon as the pain is off, thus prolonging this stage of the labor, which is nothing to compare with a like condition in the second stage. I have mentioned some injuries that take

place in the second stage of labor, but thought proper to mention them here as this is the only time to take steps to prevent them.

Anesthesia is not to be thought of in the first stage of labor unless it becomes necessary to forcibly dilate the cervix in the manner mentioned above, but it is quite as necessary to get relief from a portion of the suffering during the first as the second stage of labor. Chloral hydrate has been so effectual in my hands I have never found it necessary to seek for a better remedy.

It frequently happens that the patient lives in the country and the physician is pressed for time. The question would naturally come up as to what he should do under such circumstances. I answer, if there are any complications he has no right to leave his patient; if not, it is better to give her proper attention in the first stage as to diagnosis and preparatory treatment, and leave her with some neighbor who has been instructed what to do provided the child is born in his absence, and leave her to nature during the second and third stages rather than hurry her into the second stage before dilatation of the cervix is complete.

DISCUSSION.

DR. H. W. CROUSE, Victoria: I can not understand how the author of the paper just read can arrive at the date of confinement so closely. I have been practicing medicine for years, and have had many cases of obstetrics, but have never been so fortunate as to get my date of labor fixed so accurately. The concensus of opinion of obstetrical men upon this point today is that we can never exactly state when labor will occur. The general rule utilized today, I believe, is the taking of the last menstrual period and counting from that 280 days. We find this to be fallacious, because, as is legally recognized by the English and American governments, some women may only go 240 days and some as far as 320, but that 280 is the mean average. We have to take into consideration the well-known fact that menstruation may continue for the first three or four months of pregnancy. I have come in contact with one case which menstruated the entire nine months, every twenty-eight days. Utilizing the period of quickening as the data, we have found that this varies at least one month. Frequently the statement of the patient is incorrect, from the fact that she may take intestinal gas, and its accompanying gurgling movements, etc., for fœtal move-

ments. We have, after summarizing all of the points from which we can build up our conclusions, but one which is absolutely accurate: that pregnancy positively exists; that is, the fœtal heart beat. The first period, which we are able to secure the confirmation of pregnancy through this means also varies decidedly. Playfair, Lusk, Granden and Jarmon, Hermann and others tell us that we may be mistaken, and that after all careful investigation that there is but one positive sign of conception, and that is the fœtal heart beat. At the termination of the first stage of labor, the dilatation of the os by means of the fingers is a rather difficult proposition, and, in the average case, I believe should not be attempted. In my opinion, we should simply make a careful pelvic measurement, a careful examination as to the presenting part, and, having made up our diagnosis as to the presentation, leave the case entirely alone if everything is found normal. Why we should hasten labor and cause extra exertion on the part of the woman with a normal pelvic cavity and presentation is beyond my ken. In my opinion, such efforts are simply meddlesome midwifery. When we are called into the country and have to make the first pelvic examination and find a normal presentation, the best thing to do is to let your patient alone —that is, if you wish to avoid the liability of infection.

SECTION ON SURGERY.

CHAIRMAN'S ADDRESS.—THE RELATION OF ANATOMY TO SURGERY.

WM. KEILLER, F. R. C. (Ed.),
Professor of Anatomy, University of Texas.

In opening the Section on Surgery I have first to thank you very heartily for the honor you have conferred upon me in making me Chairman of the Section. From the time I joined the Association, eleven years ago, I have endeavored to identify myself with the Surgical Section by frequent papers, and I fear by too great a tendency to get on my feet on all occasions, and no official position could have been more welcome than the one which I occupy today.

That anatomy is one of the foundation stones of all sound medicine and surgery is a truth that does not need to be emphasized to this Association, and yet as a teacher of anatomy, and especially of human anatomy as it must appeal to the doctor, I feel that I have something to say for my subject which is worth while. Great progress has been made in the past ten or fifteen years in the practical application of anatomy to surgery. With aseptic methods, reliable ligature, which can be buried in dozens with little fear of their giving trouble, in days when pus in a primary operation has become a reproach and a synonym for dirt surgery, the field for successful operation has become enormously extended and there is no organ in the body which may not have to be approached by knife or suture. Surely, then, it is time that surgical applied anatomy become a prominent feature in the curriculum of every medical school.

Let us think for a moment of some of the things that exact anatomy has done for surgery. Among amputations Syme's amputation at the ankle-joint, Taraboef's on the upper third of the leg, hip-

joint, shoulder-joint and interscapula-thoracic amputation are triumphs of careful or faulty amputations that we see are evidences that there is more anatomy in the principles which should govern good amputations than some would make you believe. I do think that text-books on operative surgery dwell too little on the anatomic basis of successful stump-making in each section of the extremities. There is all the difference imaginable between taking off a member and getting the best possible stump; and it is nearly all a question of the careful application of general principles to the anatomy of the part, the varying retractility of the muscles, the distribution of the blood-vessels. But amputation is the last resort of the good surgeon, and conservatism is the watchword of the modern surgery of traumatisms. And it is here that an accurate knowledge of the interrelations of muscles, vessels, nerves and bones will enable one surgeon to save, while another would sacrifice a limb, on which, perhaps, depend a wife and children for life's necessities. In abdominal surgery it is marvelous what anatomy and asepsis have made possible. One noticeable feature of modern abdominal surgery is the passing away of large pedicles. The largest ovarian tumors are only fed by the ovarian and uterine and a few adventitious vessels, and these are looked for intelligently and secured in small ligatures, where several years ago great pedicles were strangulated in silken ropes and complicated Staffordshire and other knots. The uterus, however large, is only supplied by two arteries on each side and these secured, its removal, except for adhesions, is comparatively simple. But the ovarian and uterine arteries are very close to the ureters, and the surgeon who has a vivid picture in his mind of their interrelations will, other things being equal, be the safer operator. It is the careful anatomic work of Kelly and my own contemporaneous but the less known work on the blood-vessels of the kidneys that has put exploration of the pelvis of that organ on a sound anatomic basis, and to Kelly we owe the rules for its safe performance. A little anatomic rule tells the surgeon at once which is the upper and which the lower end of the first piece of collapsed or distended bowel he may meet in operating for intestinal obstruc-

tion, and on his application of that rule may depend the life of his patient; and the recollection that the three longitudinal muscular bands of the colon each and all lead to the vermiform appendix will simplify marvelously the search for that little and often very offensive relic of a herbivorous ancestry. In the neck, how very brilliant, how complicated, are the operations that sound anatomy and aseptic methods have made possible.

That tuberculous glands may be successfully dissected off the internal jugular vein, carotid sheath, and vagus nerve from end to end, and the internal jugular be removed with them from its origin at the base of the skull to near its junction with the subclavian vein. is surely a triumphal product of the union of anatomy and surgery. I know no more beautiful application of good anatomy to the practice of surgery than the enucleation of infected glands in the neck. Till lately it was thought impossible completely to remove the parotid gland, but I have recently shown that a little anatomic study enables one to formulate an operation which makes its complete removal comparatively simple. The Casserian ganglion is now removed successfully for persistent trifacial neuralgia, and the surgeon scorns the old blunderbuss method of destroying Meckel's ganglion through the maxillary antrum for the same affection; nay, it has been proposed to cut the sensory root of the fifth nerve before it joins the ganglion, and this has been done and promises to be the better operation.

Surely, the day is past when the would-be surgeon may belittle anatomy, and it is noteworthy that most of our leading surgeons have at one time been demonstrators of anatomy. And how much safe rapidity, how much security, how much caution at the right time, will an accurate knowledge of anatomy give the surgeon. Other things being equal, it will be the accurate anatomist who will cut boldly and rapidly where such a procedure is safe; who will recognize every structure as he comes on it, and know what to expect next; who will dissect slowly and carefully where important vessels, nerves or organs are to be found or avoided; who, in fact, will be the safest, surest, quickest surgeon.

Having, as I doubt not you will admit, made out a good case for my subject, how are we best to teach it to medical students? First, last and all the time the teaching must be practical. I care nothing for the man who can rattle off a page of Gray, still less for him who has his quiz-compend at his tongue's tip. I want the man who is personally familiar with bone, muscle, artery and nerve, thorax, abdomen, head and brain; who can recognize an inch of ureter at the bottom of an abdominal incision; who can tell a muscle from its depth and the direction of its fibres; but he must know his book work too. And there is little anatomy that we can cast aside as useless. First, let us make general anatomists before we make specialists, and let us take some time to the process. There is a tendency in modern medical schools toward what is called concentration in teaching. Now, it must not be forgotten that there is a limit to the possibilities of concentration if the student is to retain with any permanency the knowledge that he is gaining by observation. I doubt if any student can do more than two hours good practical anatomic study continuously, and the facts slowly accumulated by eight months work, of two hours daily, will be more firmly fixed in the memory than they would be were they crammed into four months of four hours daily work. The student slowly develops in an anatomic atmosphere. He imbibes it, digests it, makes it his own; and, therefore, our students spend two hours daily through two scholastic years of eight months each, learning practically the general anatomy of the human body. In his third year he should study anatomy as applied to surgery and medicine, and that, also, should not be a lecture, but a practical course. It will now be his business to cut down on the carotid or brachial or other artery as he would meet it in operation; to recognize it and its relations through a three inch incision. He will outline on the scalp the fissure of Rolando and verify the correctness of his outline by cutting down on it; he will study the extremities by sections where the most important amputations are performed, and see where to get his flaps and what will be their blood supply; he will study muscular actions for their effect on fractures, joints for the anatomy of dis-

location, the abdominal wall for surface relations, and the most suitable incisions to reach desired organs and avoid subsequent ventral hernia. Such is the course of practical surgical anatomy I have outlined for the third year's work in our university; but to carry it out I want more anatomic material, and it is just here, gentlemen, that I want your assistance. I use thirty bodies every year in teaching anatomy. I require fifty to teach it as it should be taught. In three successive legislatures we have vainly tried to get an anatomic law passed, a law carefully framed to be a hardship to no man, to hurt the feelings of no possible survivors of the unclaimed dead. And three times we have failed. Twice the Governor vetoed it, and this time the Senate failed to pass it. Now, gentlemen, I appeal to you, for the sake of our State institution, for the sake of the profession in Texas, for the better teaching of those young men who are to have in their charge the lives of your children and children's children, lose no opportunity in impressing your representatives with the need of a law justly and wisely framed to enable us to use for teaching purposes the bodies of the unclaimed and friendless dead. Surely, it is the very reverse of sacrilege, and it is strange that the State should compel its own school to break its own laws. It is only by steady work long ahead of the time that our legislators can be taught our dire necessities.

A CASE OF INTRA-ABDOMINAL SUPPURATION OF OBSCURE ORIGIN.

A. L. HATHCOCK, M. D.,

PALESTINE, TEXAS.

I might have entitled my paper "A Case of Left-Side Appendicitis," but I have preferred not to do so, for the reason that I am not absolutely sure that it was a case of appendicitis, and if it was, I do not believe the cæcum and appendix were abnormally situated on the left side, but that the appendix was long enough to reach from the right to the left side, where a perforation occurred, or, at any rate, an infection of the peritoneum took place. My reason for so thinking will appear in the course of the paper.

The patient, D. S., a boy 12 years old, is the son of a large, healthy man whose mother and another near relative died of pulmonary tuberculosis. The patient's mother is perfectlv healthly, and her family history is free from any hereditary diesase. The personal history is negative, with the exception of an attack of dysentery at the age of three, from which he recovered without any sequelæ. Up to the time of onset of the disease under consideration, he was an unusually healthy boy and large for his age. On July 13, 1902, he was taken ill, and Dr. J. L. Hall was called in, and to him, as well as to Drs. J. B. Smith, W. C. Lipscomb and J. S. Wootters, I am indebted for the history of the earlier part of the attack. He had eaten heartily of peaches, watermelon and canned sardines at different times during the day, and the attack began suddenly with a severe pain in the right iliac region, followed quickly by nausea and vomiting, which did not relieve the pain. The next day the temperature reached 102° F., and he had severe pain in the left iliac and right hypochondriac regions, as well as in the right iliac region. Difficulty was experienced in getting the bowels to act; the abdomen was distended and tender, and the legs

drawn up. The fever ran an irregular course, of low degree, and the pulse kept pace with the temperature. The pain was felt at one time, early in the first week, most severely under the left nipple. Later, it became diffused over the abdomen, and became less acute. At the end of a week the temperature became normal for two days, then recurred, resuming its irregular course. About this time—the ninth day—a hard lump was felt in the right hypochondrium, and a few days later a similar tumor was discovered in the left iliac region. The former slowly disappeared, but the latter increased in size, was tender and the physicians in attendance suspected that pus had formed therein. It was about this time, a little more than two weeks from the beginning of the attack, that I saw the case first in consultation with Drs. J. B. Smith, J. S. Wootters, and W. C. Lipscomb, of Crockett, Texas, and A. D. DuPuy, of San Antonio. He was emaciated and anæmic; the bowels were slightly constipated, the abdomen distended with gas, the temperature 100° F. and the pulse about 80. In the left iliac region, and extending somewhat into the hypogastrium, was a distinct mass, the most prominent point of which lay about two inches to the left of the median line and one and a half inch below the umbilicus. The tenderness in and around this mass reached the right side but not as far as McBurney's point. No other abdominal tumor could be made out at this time. On August 1st the patient was brought to my private sanitarium, with a view of operating as soon as the circumstances seemed favorable. Ten days were spent in an effort to improve his general condition, and during this time a careful record was kept of all the functions, and the following data may be of interest: The temperature ranged from normal to 102.4° F., usually below 102°. There were no chills or sweats, and the pulse rate was increased. Occasionally the pulse rate fell as the temperature rose, and once an increase of one degree F. of temperature was attended by an increase of thirty beats of the pulse, without any other unusual symptoms. He passed an average of twenty ounces of urine daily, of a high specific gravity, highly colored but containing no albumen or sugar. There were no casts

and the small sediment consisted of mucus and bladder epithelium. The blood count showed 4,500,000 red and 12,000 white corpuscles. The hæmaglobin was not estimated. There were no malarial parasites. The digestion was feeble, and he was given only liquid food, but milk curds appeared in the stools frequently, in spite of dilution with an equal amount of water.

OPERATION.

On August 10th, after the usual preparations, ether was administered, and the abdomen was opened by an incision two inches long, beginning half an inch above the pubic bone and one and one-half inch to the left of the median line, extending upward parallel with the linea alba and over the most prominent part of the tumor. The adhesions were burrowed through with the finger in a direction vertical to the incision, but no pus was found. The muscles and skin were then retracted an inch toward the median line, and the peritoneum opened at this point. Using the finger again to break through the adhesions, a pus cavity, containing about two and one-half ounces of pus, was opened and emptied by mopping. After exploring the walls of the cavity, it was packed with iodoform gauze.

The cavity was situated over the bladder and a little to the left of its center. Its walls were smooth, and it was tightly adherent to the anterior abdominal walls. A sinus, not large enough to admit the finger, extended downward behind the bladder.

The temperature rose to 100° F. and the pulse to 160 within a few hours after the operation, but fell the following day, the temperature to normal and the pulse to 115. The bowels acted on the third day, and convalescence was rapid. The gauze packing was removed on the fourth day and renewed every third day thereafter. He was discharged on the first of September, just one month from the date of his admission, with this observation: The abscess cavity has closed completely and only a small superficial wound remains unhealed.

I understand there was some delay in the final closing of this

small wound, and that a physician in San Antonio removed what he thought was a ligature, but which must have been a thread of gauze, for there was no ligature placed in the wound.

The chief point of interest in this case, was, to me, the determination of the original source of infection of the peritoneum. To say that the case was one of peritonitis, with local suppuration, was easy, but to name the exact cause of the peritonitis and abscess formation, was a more difficult matter. Certain diseases of the alimentary canal naturally suggested themselves as the most likely cause, and a perforated typhoid, gastric or duodenal ulcer, ulceration of the sigmoid and appendicitis, were considered. The history of perfect health up to the time of the onset and the location of the chief amount of trouble in the lower half of the abdomen seemed sufficient to eliminate gastric and duodenal ulceration, while the age, history and absence of any symptoms referable to the lower bowel made it comparatively certain that the sigmoid was not diseased.

When we come to typhoid fever, one might be inclined to exclude it because of the sudden onset, without previous symptoms. Reflection reminds us, however, of an occasional case of typhoid that goes on to perforation without marked symptoms and without the patient being aware of the fact of his having any disease.

I saw a young man, about a year ago, who plowed in the field every day, until he was attacked suddenly with severe pain in the abdomen, collapse and death within thirty-six hours. An autopsy was not done, but inquiry elicited the fact that he had been a little unwell for two weeks or more; that he had complained of feeling feverish at night, and that he did not look as well and did not seem as energetic as usual. I thought I was fully justified in concluding that he had had typhoid fever for at least two or three weeks, and that a perforation had put an end to his life.

In the present case, however, there was absolutely no symptom of the slightest illness before the attack, and there was no collapse, as is usually the case in a perforation of typhoid. These facts

enabled me to conclude with confidence that we were not dealing with typhoid fever.

Of all the diseases of the alimentary canal, then, we have left only appendicitis as a possible cause of the trouble before us. Studying carefully the symptoms of the beginning of the attack, which I consider of very great importance in the diagnosis of appendicitis, we have the sudden onset with previous good health, pain and tenderness in the right iliac fossa, nausea and vomiting, without relief of pain, and these followed by rise of temperature and increase of pulse rate. Add to this, rigidity of the right rectus muscle, which was not noted but which probably existed, and we have all the cardinal symptoms of an acute appendicitis. On the following day, however, this distinct picture becomes blurred. Pain is felt as severely in the left iliac fossa as in the right, and there is also pain in the right hypochondrium. Later on, a tumor appears in the right hypochondrium, disappears and another forms in the left iliac region; certainly sufficiently irregular to justify one in reconsidering the diagnosis. Infection from a diseased gall bladder, a suppurating cyst of the liver, or a suppurating lymph gland, tubercular peritonitis and tuberculosis of the bones of the abdominal walls, were all thought of and dismissed, as not conforming reasonably to the symptoms.

Suppuration, occurring in the space of Retzius, was strongly suggested by the location of the abscess, as it appeared in the latter part of the patient's illness, but in no other respect could it be made to answer to the conditions present. The operation showed, too, that the abscess was intra-peritoneal.

So, after all, the diagnosis of appendicitis would be most likely to be correct. Accepting it as the correct diagnosis, what explanation of the irregular features of the case can be made? How are we to explain the existence of pain in both the right and left iliac regions, and the formation of an abscess on the left side? The case began as a fairly typical case of right-sided appendicitis, and ended as a left-sided one. The simplest explanation, and the only one I have to offer, is that the appendix situated normally on the right

side was long enough to reach across the median line into the left iliac fossa where it infected the peritoneum sufficiently to produce pain and result in the formation of an abscess. The patient being a boy and probably not fully developed (although he was unusually large for his age), it might seem likely that th cæcum had not assumed its normal position in the right iliac fossa; but if we accept that view, how will we account for the pain in the right side, in the beginning of the attack?

I hope to have a free expression of opinion on this point, and to gain a clearer understanding of it from the discussion.

DISCUSSION.

DR. H. W. CROUSE, Victoria: I believe that the case that the doctor has just so beautifully described for us to be one of appendicular abscess. It is a well-known fact that we have at times a true wandering abscess existing in appendicular cases; further that the location of the appendix is decidedly varying, at times beneath the liver, at others in the right iliac fossa, and again to the left of the median line. I have seen one or two cases, which, when observed at first, were located in the normal position of McBurney's point which, with all the signs of rupture, wandered, as it did in one case that I recall, into the cul-de-sac of Douglas in a female patient. Taking all the points the doctor has laid before us, I am quite sure that his case was one which we could denominate properly as wandering appendicular abscess.

THE GLYCERITE OF BOROGLYCERIN AS A SURGICAL DRESSING.

R. W. KNOX, M. D.,

HOUSTON, TEXAS.

The United States Pharmacopœia states that boroglycerin is a combination of 62 parts of boric acid and 92 parts of glycerine reduced by heat to 100 parts. Kennedy states that boroglycerin is a definite chemical compound and not a mechanical mixture. The official preparation and the one used as a surgical dressing, and ordinarily called boroglyceride, is correctly named glycerite of boroglycerin and is prepared by combining, under heat, equal parts of boroglycerin and glycerine. It is commercially known as 40 per cent boroglyceride. I have found that the druggists in this climate prepare a very inferior product, due probably to the excessive moisture in the atmosphere and the hydroscopic properties of the glycerine. On this account, I have made it a rule to order this preparation ready-made from certain well known pharmaceutical houses. The 50 per cent solution may be still further reduced with glycerine or distilled extract of witch hazel, or with water when a solution is desired, or it may be made into an *ointment* salve, by combining it with the ointment of rose water or other simple cerate.

I have found this preparation useful in burns, scalds, phlegmons, and other inflammations; also for packing abscess cavities, ulcerations and infected wounds. For burns or scalds the distilled extract may be used as a diluent. In hospital practice especially, I find it meets a long-felt want, and much superior to the various and sundry powders that are ordinarily employed. My preference for the use of boroglyceride is based on the following: 1. It is antiseptic. 2. It is easy to apply, very clean, and has no odor. 3. It hastens the healing process by not crusting the wound and retaining pus. 4. Prevents exuberant granulation and the formation of pus.

5. It is soothing to granulating wounds. 6. It reduces inflammation by relieving the congested capillaries. 7. It hastens the scaring of wounds. 8. It is non-toxic.

It will be readily seen that such an agent will be valuable in treating crushing injuries and lacerations on any part of the body. It would not be advisable to use this agent to the exclusion of everything else, for it is often necessary, when inflammation is high or infection imminent, that hot applications be applied until a healthy granulation is seen, and after this the boroglyceride will hasten the healing. If the use of this great agent is a hobby with myself, it has become so after an earnest and patient effort to get a dressing that would give the best results and give the patient the least inconvenience.

I have seen no cause to regret an almost routine application of this agent in suitable cases in hospital as well as in private practice, and feel quite sure that the more faithful adoption of this old remedy will bring better results than many of the more recent pharmaceutical efforts.

FARABEUF'S AMPUTATION AT THE SEAT OF ELECTION.

JAMES E. THOMPSON, M. D.,

GALVESTON, TEXAS.

After careful analysis of numbers of amputations coming under my observation, from various parts of the country, I have been forced to the conclusion that if they represent modern skill in this branch of surgery, there is room for a vast amount of improvement. It is a rare thing to see a stump that defies criticism. Some are fair, but the great majority are very bad. It is only fair to say that nearly all the cases are of the wandering type, that have been treated in hospitals, but it is just in such cases that one would expect to see the best work.

I found early, in my experience as a teacher of operative surgery on the cadaver, that it was next to an impossibility to make the average student learn the steps of each typical amputation, with sufficient accuracy to make him a safe operator. I was often told that I was too hard on them, and that they (the students) did not think it was necessary to remember all the anatomical points that I insisted on. Some even told me that their preceptors knew little anatomy, but had nevertheless great reputations as surgeons. To this I could only retort that their reputations would have been still greater if they had known more.

I argued that, if this objection to accuracy in learning is present in our youth with their active brains, when they become older the distaste will become stronger. However much anatomy a man learns, he will in time forget a certain proportion of it, unless he continually reviews the subject. Also, that if minute methods are not taught at school, they will not be required in after-life. So I have continued, year by year, to correct this at the fountain head, and have exacted the most minute attention to details.

Many amputations are emergencies. The doctor is called in, and has to perform amputations without a consultation and without referring to his books to refresh his memory. In this respect his position is unique. No other professional man is required to store up in his mind accurate information on all points. A lawyer has the privilege of consulting his books even in the presence of his client. But not so the doctor. It would, indeed, be a unique sight to see a doctor performing an amputation with an open text-book by his side. Any yet, it would be much better to do so, if by it a more satisfactory result could be obtained. Nevertheless, at the present time, such a procedure would jeopardize the reputation of the most famous man. We must then accept the inevitable, and fortify ourselves by accurate information. Thus only can we avoid bad or indifferent work.

It seems an easy matter to remove a limb; and, from a butcher's point of view, it is. Owing to the introduction of antisepsis and surgical cleanliness, we have robbed these operations of most of the terrors, and many of their evil consequences. We rarely pay, nowadays, the full penalty of slovenly or indifferent work by losing the life of the patient—a frequent occurrence before the antiseptic era—but the patient carries with him for life a painful or useless stump; and if knowledge comes to him afterwards, anathematizes us forever with vigor and pith.

Let us then consider the necessary points that should be carefully considered before and during an amputation.

1. *Examine carefully the condition of the soft parts, and determine the lowest possible point that can be safely included in the flap.* This can be done usually by a careful examination. In some cases doubtful areas can be safely explored by short incisions into the subcutaneous tissues. In very few cases, except in the hands and feet, is any doubtful tissue to be used in the formation of a flap.

2. *Determine next the lowest possible point at which the bone or bones can be divided, and still be covered by well-nourished flaps.*

(This many not be advisable in some cases, as for example in the leg, where we often amputate at the seat of election, although it would be possible to divide the bones at a much lower level.) This necessitates a knowledge of three distinct conditions.

(a) *The distance the divided skin will retract.*

(b) *The distance the divided muscles will retract.*

(c) *The course and distribution of the blood vessels supplying the flap.*

RETRACTION OF THE SKIN.

Owing to the elastic nature of the skin, the lips of an ordinary incision will retract from one another considerably. The extent of this retraction varies in different parts of the body. It is usually greater where the skin is thin and the subcutaneous tissue is loose and scanty, i. e., in the forearm over the prominence of the biceps, the front of the elbow, the anterior surface of the forearm, the back of the wrist, over the popliteal space, and the dorsum of the foot. On the other hand, it is least where the skin is thickest or firmly attached by subcutaneous tissue to the deep aponeuroses. Such tissues are the palm of the hand, the fingers, soft parts behind the elbow, in front of the knee, sole of the foot.

Speaking generally, we may say that if a part needs to be covered by a flap consisting entirely of skin, the flap will lose one-third of its length after it is cut. Thus, if a skin to cover a bone requires to be 8 c. m. long before cutting, it should actually be made 12 c. m. long. We must not forget that inflamed and œdematous skin retracts but little. This, however, will not prevent the skin from subsequently regaining its powers, and the secondary retraction may cause the flap to contract over the stump somewhat tightly.

CONTRACTION AND RETRACTION OF MUSCLES.

All muscles contract unequally after division. Farabeuf states that if the sartorius muscle be freed from its sheath and divided near its lower end, it will shorten by four-fifths of its length. The muscles that contract most are those with a long distance between

their origins and insertions. Such are the "biceps humeri, the flexor muscles of the forearm, the hamstrings, sartorious and gastrocnemius." The muscles that contract least are those that are connected with bone near the seat of division, such as the "triceps humeri, brachialis anticus, extensors of the forearm (near the upper end), quadriceps extensor and flexor longus hallicis in the middle of the leg." In addition to this immediate contraction, there is almost always a subsequent retraction. This, however, is insignificant.

In cutting flaps, this unequal contraction must always be carefully considered. Otherwise, if the muscles are cut through at the same level, as occurs in cutting flaps by transfixion, there will be unequal retraction, and the resulting flap will be very irregular. The longer muscles must be cut at a lower level than the shorter. This is exemplified in amputation of the arm, where it is necessary to divide the biceps at the level of the retracted skin incision, and then after further retraction, which is then possible, the other muscles are divided at a higher level. Also in amputation through the leg, the gastrocnemius is divided at a lower level than the other muscles.

In circular amputations, where a terminal scar is desired, the unequal contraction of the muscles will often make the skin incision elliptical, and the scar will then be lateral. This is often seen in amputation through the lower thirds of the arm and leg.

To avoid the evil results of unequal contraction, the tendency seems to be to divide each muscle separately, cutting from the surface toward the deeper planes, and allowing each muscle to contract before dividing those placed deeper. This practically means the abandoment of the transfixion method of cutting flaps.

THE COURSE AND DISTRIBUTION OF THE BLOOD VESSELS SUPPLYING THE FLAPS.

Accurate anatomical knowledge of the blood vessels that will nourish the flap is a first essential. Flaps, consisting of skin and subcutaneous tissue only, can not be made too long without danger.

Over the front the knee and behind the elbow joint, they can be cut longer and with less danger of sloughing than in any other part of the body. Sometimes the slightest slip of the knife will imperil the life of a flap, as in Syme's amputation, while fashioning the heel flap, or in a Farabeuf's amputation at the seat of election, while cutting the external flap, the anterior tibial artery may be cut where it is penetrating the interosseous membrane. All blood vessels must be divided terminally. It is usually a bad practice to tie the main artery at a higher point to prevent bleeding, although this is at times advisable and necessary in certain amputations at the hip joint. Where the flaps are transfixed, care must be taken not to split the blood vessels longitudinally.

3. *Make a choice of the best method of covering the bones.* We must naturally ask the question, "What will be expected from the amputation stump? What service will it be called upon to perform?" If it is to receive terminal pressure, the scar must be laterally placed; if lateral, the scar must be terminal. Again, it would be absurd to remove the end of the metacarpal bone, after disarticulation, if the patient were a laborer; whereas, if he were a rich man, this would be perfectly justifiable and would give an excellent cosmetic result.

The best solution, in each individual case, can only be reached by a thorough knowledge of all of the classical procedures, from which a choice can be made. It must be acknowledged that the crystallized knowledge of generations of surgeons is better than the solitary inspiration of a novice. In no class of work is it more necessary to be master of the exact details. We must make our choice of a method, and proceed to execute it with the precision of a tailor, the knowledge of an anatomist and the skill of a surgeon. As time passes, new methods will be introduced; but rarely as inspirations. Farabeuf himself, in his preface to the description of his operation at the seat of election, says: "I have dissected legs by the hundreds before arriving at the details of the following operation."

I would lay down the rules of amputations in the following way:

Given ordinary conditions, as in amputations for disease, the flaps should be fashioned as closely as possible according to the classical procedures. In the hand and foot, and in amputation near the joints, we can rarely deviate with advantage from the recognized methods, although many trimming operations can and must be resorted to.

1. Speaking generally, we may say that in the forearm, arm, leg and thigh, *the sum total of the lengths of the flaps must be at least one diameter and a half,* measured through the limb at the point where the bones are to be divided. The diameter must be taken in the direction the flaps are expected to lie. If the flaps are anterior and posterior, the diameter is an anteroposterior diameter; it lateral, a lateral diameter. These measurements may be a little too short, under certain circumstances. These are: (1) When the section of the bones is large compared with that of the soft parts. Lower end of radius and femur. Upper end of tibia. (2) In cases where the limb is inflamed or œdematous, and secondary retraction is to be feared. (3) Where the amputation is performed a long distance from the root of the limb; just above the elbow, wrist, knee or ankle.

2. *The flaps must be carefully measured.* There is no excuse for not doing this. The period when it was considered the proper thing to lop off a limb with the rapidity of lightning, has long passed. It is only after long practice that a surgeon acquires the skill to fashion the flaps with his eye alone. I have only seen one man who could even approach this degree of skill, and I have seen him cut out some sorry flaps.

3. *The base of the flap* (i. e., the shortest distance across the limb, between the origin and the termination of the incision, to mark out the flap), *must always measure one-half of the circumference of the limb at that point.* Failure to attend to this will prevent the flaps from coming into accurate apposition.

4. *The incisions should always be made through skin and superficial tissue, and the flaps marked out.* The integument should

then be retracted a little along the whole incisions before the muscles are divided.

5. *The flaps are best fashioned by cutting each muscle separately from without inward.* (There are, of course, exceptions to this rule, as previously indicated.) By this means we allow the more contractile muscles to retract first, and are then able to cut the others at the level of the retracted ones.

With this rather long preamble, I will now proceed to the description of an amputation which embodies nearly all of the qualities that go to make a good amputation stump. This is an operation at the seat of "election," described by Farabeuf.

The seat of election, as is well known, is a hand's breadth below the line of the knee joint. The tibia is sawed there and the saw-line is usually just above the foramen for the nutrient artery.

The directions are the following:

RIGHT LIMB.

1. *Skin incisions.* The *external flap* is U-shaped. The incision begins above opposite the saw-line and just internal to the tibial crest. It passes directly downward inside the tibial crest for about three inches, then curves downward and outward across the limb (the lower end being placed one transverse diameter below the starting point), then curves upward toward the posterior aspect of the limb, in a direction diametrically opposed to that it had in starting, until it reaches a point almost diametrically opposite the starting point. (The base of the flap must be half the circumference of the limb.)

The internal flap is marked out by an incision which starts from a point one and a half inches below the commencement of the anterior limb of the U, passes across the inner side of the limb and terminates at the upper end of the posterior limb of the U.

The incisions at first concern skin only. Then the skin is loosened for about *half an inch* along the whole length of the incisions.

2. *Cutting the muscles in the flaps.* (a) *Large external flap.*

Insert the point of the knife at the upper end of the anterior incision and cut the aponeurosis from above downward along the line of the retracted skin. This must be done from end to end of the cut. The muscles then appear as if herniated. Insinuate the left forefinger between the tibia and the tibialis anticus muscle, and separate the muscles from bone as far as the interosseous membrane. Pull the extensor muscles outward and divide them obliquely toward the tibia and fibula, entering the knife at the level of the retracted skin. Cut the muscles to bone all around the incision and carefully raise the flap from the outer surface of the tibia, the anterior surface of the interosseous membrane and the outer surface of the fibula. The flap is lifted from the surface of the tibia and the interosseous membrane with the left forefinger, but it will be necessary to use the knife in separating it from the fibula. The greatest care must be used to protect the anterior tibial artery. It lies on the deep surface of the flap in its whole length, and upon it depends the vitality of the whole flap. It is better to guard it carefully with the finger during the time when the knife is being used. It is nearer the fibula than the tibia, and it is during the separation of the peroneal muscles from their attachments that it is in danger. The flap must be thrown up as far as the level of the proposed saw cut.

(b) *The internal flap.* This can be cut conveniently by transfixion. The knife is entered at the upper end of the inner incision and carried carefully across the bones and interosseous membrane, emerging at the level of the retracted skin.

(c) *Cleaning the bones.* The uncut soft tissues must be carefully divided, and a transverse cut made in the interosseous membrane at the upper end. All the soft tissues and periosteum must be retracted as high as the level of the future saw cut.

(d) *Division of the bones.* Retract the flaps with a three-tailed bandage. Saw the fibula at a slightly higher level than the tibia. Make an oblique cut on the anterior border of the tibia, entering somewhat higher than the proposed level of the main saw cut. Let it be carried about half-way through the bone. Then

withdraw the saw and enter it transversely at the level desired and cut straight through the bone. This will bevel the anterior edge of the tibia, and prevent it from projecting through the flaps.

(e) *The scar lies on the inner surface of the limb, and is not terminal.* This operation has stood the test of many years, and is now pronounced to be the best operation at the seat of election. The external flap is perfectly nourished, and forms a splendid pad for the end of the tibia. The scar is lateral and so situated that it is free from all pressure.

It is not as widely understood as it deserves to be, and if this communication is the means of bringing it to the notice of the profession, I am certain that they will find it the best of all the operations at this level.

APPENDICITIS—A DISCUSSION OF ITS TREATMENT, WITH REPORT OF CASES.

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In my study of the reports of cases and the discussions as to treatment, I am impressed with the great anomaly of pathological conditions and symptoms met with in appendicitis.

In conversation with a medical friend, a short time ago, he remarked: "I know of no disease where a single case teaches so little as does appendicitis." In reporting my cases, perhaps some new pathological curiosities may be added to the literature, while the subject of treatment will stimulate a discussion that will surely result in benefiting myself and perhaps others.

The medical student who carefully studies a text-boox description of pneumonia or typhoid fever, will always be able to recognize, with little difficulty, the main symptoms and conditions in the great majority of his cases. This can only be said in a general way of appendicitis. It is surely a disease of anomalies, especially after the first attack. No doubt the early conditions are similar, if we could get any reliable information regarding the pathology at such a time. As the hitsory of the case goes on, the conditions change, and I can say that I have never been able to tell with any degree of accuracy what was going on in the appendix or the tissues surrounding it. The symptoms do not keep pace with the pathological changes. Often, when the symptoms seem to be improving, the case suddenly goes on to death, and an autopsy reveals the fact that the symptoms were misleading. The majority of surgeons are agreed that an early operation, say within thirty-six hours, offers, by far, the best chances for the life of the patient, his future freedom from complications, and consequent bad health. The early operation also lightens the work of the surgeon and robs the dis-

ease of its anomalous conditions. The mortality of appendicitis must come down if the early operation becomes settled. Those cases which have passed the time for an early operation will become a distinct class and have a variety of symptoms and many methods of treatment, but with a higher mortality and with more frequent complications following all cases that recover. Those cases that reach the interval period, certainly demand an operation, and will have a low mortality. Some surgeons have a mortality of one-fourth per cent. No one who has allowed his case to go beyond the thirty-six hour period can show such a low mortality. Still, I do not say that some cases will not get better under an expectant plan of treatment. Some cases refuse operation; some are away from the proper surroundings for an operation, and some treatment must be given them. The best treatment in such cases is perfect rest, with an ice-bag applied over the appendix. The term rest is now made to include rest of the stomach and bowels from food and medicine. The colon should be emptied by enemata, and the patient can be fed by the rectum. Absolutely nothing is given by the mouth. Some cases will improve and the interval will come. Some cases will grow progressively worse. Perforation and diffuse peritonitis will occur even when the bowel is covered with ice-bags.

This being the case, it is our duty to do all in our power to give the patient the benefit of an early operation. The following case will show that improvement will follow the expectant plan:

R. W. C., male, age 26; cowman. On June 6, 1902, he was taken suddenly with general cramping in abdomen. Pain severe, and patient unable to walk. His friends carried him to a neighbor's house, where I saw him one hour later. Found the symptoms as typical as any case of appendicitis could be. The general cramping was followed by exquisite tenderness over McBurney's point. An ice-bag was applied over the right iliac fossa, all food and medicine was prohibited by mouth, and a hot soap-suds enema given. Operation was advised at once. Consultation was asked for, the diagnosis confirmed and we insisted upon an operation

The patient decided to take the chances, as he was away from home and wanted a more convenient time. The condition rapidly improved and in three days all symptoms were gone, save tenderness over the appendix, which remained for some time. To this day he has never had another attack. At times he talks of having the operation done, and says that he had had occasional pain in that side. His ranch is sixty miles from a physician, and some day you may hear the final report of his case. The most satisfactory time for an operation would be in the interval.

When we see a case in the early period of an attack, and some one speaks of the advisability of waiting for an interval, I always ask: "Can you guarantee that an interval will ever come?" Who would think of waiting to send in a fire-alarm when he saw a small blaze and a big smoke in a building? The following case will show the tedious convalescence, following a postponed operation:

R. O., male, age 23. In October, 1901, I was called to a ranch, eighteen miles in the country. Found patient suffering intensely from a recurrent attack of appendicitis. He had been complaining the previous evening, but for the last six hours had been in agonizing pain. The right thigh was flexed on abdomen; pain localized in right iliac fossa; temperature 99° and pulse 105. Had been given calomel and salts, which were promptly vomited. Explained disease to his friends, and told him that we would have to take him to city for treatment. 'Phoned in to have operating room prepared for an early operation, if required. Prepared a hack with a bed in it, and started for Midland. He complained of pain being very severe, and at the solicitation of his brother, I gave him a hypodermic of one-fourth grain morphia. This soon gave him ease, and he stool the trip nicely. When received at the sanatorium, his temperature was 99 and pulse 108. His pain was masked by the morphia, and vomiting had ceased. His friends were deluded into thinking him much improved, and refused operation. I asked for consultation, and a physician, an old-time family friend, was called from a distance. Ice-bag applied and bowels moved, following enema. Later the symptoms grew worse, vomit-

ing, and restlessness returned and the friends grew anxious for the consultation. The train was delayed for some hours. Again had operating room prepared, and again made the mistake of yielding to the demand for opium. As soon as given, patient again improved, to the satisfaction of himself and friends. The consultant thought it only a mild case; that he had gotten over the other attacks, and surely would this one. I explained that his apparent ease was due to the morphia. His pulse was increasing in rapidity, but the consultant and his friends decided to wait for an interval, and give 10-grain doses of calomel by mouth. The surgeon left on early train in evening and agreed to return if symptoms did not improve. His advice was followed, but the calomel came back, and fœcal vomiting set in the next day. He was fast passing beyond a safe operating period. Enema failed to move the bowel, and later the bowel refused to retain the nutritive enema. Pulse went slowly on to 130 and temperature to 103°. The surgeon failed to return, though repeatedly urged by his friends. Ice-bag kept constantly applied, but the abdomen became tympanitic, and for five days we watched him through the same condition. Upon October 7th, we discovered that an abscess had formed, patient had several chills and pulse was 130, temperature 101. I tried to get his friends to call in some other physician, and relieve me, as they had refused the operation. That night they consented to the operation, and we evacuated a large abscess situated between the colon and right side of abdominal wall. The incision was made well to the outside of the usual line, so as to avoid the possibility of entering the abdominal cavity or the wall of the abscess, and to lessen the danger of hernia. No attempt was made to search for the appendix. In washing out the cavity, a part of the appendix, containing a concretion as large as the end of the little finger, came floating out. Another concretion was found free in the cavity. The cavity was lightly packed with gauze, and an abdominal binder applied. The bowels acted before we got him off the table. He came out from under the anæsthetic, and was free from nausea and vomiting. Patient improved and did nicely

for eighteen days, when the pulse began to increase in rapidity, and obstinate constipation, with considerable cramping, occurred. A series of chills with nausea and vomiting made us suspect another abscess. While giving an enema, I noticed the fresh gauze dressing was very much soiled, and upon examination of the cavity, found that when water was forced into the bowel, a small stream of thin watery pus made its way through a small opening into bottom of cavity. This was carefully distended by gently working the end of my finger through the opening, and I found a large pus cavity in the pelvis, extending across to the left side. Two months later patient was discharged, wound completely healed, and to this day shows no tendency to hernia, although he does general ranch work.

When called to any case attended with colic, it has been my plan to never give an opiate until satisfied as to the diagnosis and plan of treatment. To give it simply to relieve pain, is an injustice to the patient and masks the best symptoms for the physician's guidance. It works a temporary miracle, but is apt to do much harm. Again, if you have called a consultant, withhold the opiate until he has seen the case as you have. Of course, if you have a perforation with consequent shock, it is proper to give it at once.

On August 12, 1901, I was called in consultation to see R. H., male, age 20, who was suffering with a severe pain just over the crest of the ilium on the right side. The physician told me that he saw him twelve hours before, patient having had two bad chills. Complained of some nausea, loss of appetite and a severe pain in the right lumbar region. It was more on account of this peculiar position of the pain, that I was in consultation.. As we entered the room, I noticed his peculiar position in bed, with the right thigh flexed upon the abdomen. The pain had changed its peculiar position, and was now in the right iliac fossa. There was exquisite tenderness over McBurney's point, and upon close questioning, I obtained a history of two previous attacks. Pulse was not high, and all symptoms improved rapidly after application of ice-bag. Seventeen days later the patient submitted to operation. Much to our surprise, the appendix was not adherent, but was very much

distended with pus, and covered with a plastic exudate. Upon application of forceps, previous to making incision through the appendix, the increased pressure caused an ulcer near the tip to bulge the wall, almost to the point of rupture. Would another interval have ever come to this young man? I think not.

P. H. B., age 52, a chronic drunkard, who had suffered for years with all types of gastric and intestinal indigestion and had received treatment from all the neighboring physicians, came to me suffering with pain in the right iliac fossa. Pulse 86 and temperature normal. There was a slight tympanitic condition of abdomen and tenderness over the appendix. These attacks would return sometimes every two weeks, sometimes go a month, but grew worse from time to time, yet were always relieved by some simple remedy. They were so annoying as to prevent him securing a position for any length of time, and, although an unfavorable case, I decided to operate, and on May 17, 1902, operation was performed. The appendix came easily into view and was quickly removed. It contained seven foreign bodies, which proved to be small seeds. They were arranged almost equi-distant from one another. The short period required for operation, due to the absence of adhesions or other complications, made me feel sure that he would soon be convalescent. After the operation, the nurse and I counted all the sponges and accounted for them all. In fact there had been no necessity for using but one inside the abdomen, and we know it was removed. The nurse was told not to give any water by mouth, but to moisten the lips and tongue frequently with water, to prevent vomiting after the anæesthetic. One of the clean, unused gauze pads was utilized for this purpose. The next day the patient was having very severe cramps in the epigastrium, and was vomiting. These symptoms continued all day. Pulse went up to 100, and I was at a loss to understand the condition. That night I gave one-fourth grain morphia; symptoms disappeared; patient slept well. The next morning he felt no pain, said his old appendix trouble was gone, but complained of being full of gas. The wound healed nicely, and the patient was soon up. Every now and then he would

come to me, complaining of gaseous detention ond eructations, sometimes constipation and at one time the symptoms pointed to obstruction; at other times he would have diarrhea. Never any pain about the wound. Finally, he went out on a ranch in New Mexico, where he still had indigestion, and several months after the operation he sent me one of my gauze pads and a letter, saying that he had suffered a severe cramping spell, and had passed "a rag witch" from the bowel on November 20, 1902. All of his old symptoms had disappeared, and he was a well man. The fact existing beyond all doubt that this gauze sponge remained in the intestinal tract for a period of six months, makes this case unique.

In consultation with Drs. Estes and Sorter, of Baird, Texas, I operated upon H. T., age 28, who had suffered for seven years with cramp colic, indigestion and bilious colic, and had been treated for them all. His last attack had been diagnosed as appendicitis. I was asked to operate. The appendix was found closely adherent to the posterior wall of the colon. The distal end was very much distended, and a cystic like tumor about the size of an almond, was in the meso-appendix. Fearing that the appendix contained pus, we proceeded very carefully in breaking down adhesions and separating it from the colon. After its removal, the appendix was cut open and a thick, clear mucoid material escaped. It had no odor or resemblance to pus. When pressure was made upon the tumor in the meso-appendix, a similar material came through a small opening in the floor of the appendix. In the specimen, you will notice a bristle through the opening. The patient has never had the slightest pain or indigestion since, and has gained in weight and strength.

Regarding the cases of fulminating appendicitis, with rupture or perforation of appendix, and general peritoneal involvement, it would seem that an operation is always demanded. When the diagnosis of this condition is positive, a median incision is best, and we should aim at the complete removal of all infectious material. The appendix will receive first attention. If it has sloughed off, the opening of the colon should be closed. To facili-

tate drainage, another opening should be made in the right side. Every portion of the visceral and parietal peritoneum should be cleaned by sponging, and then flushed with normal salt solution. Gauze packing should be used for drainage. Several cases of iodoform poisoning have occurred, and I have decided to use only sterile gauze. A few sutures should be used to help retain the intestines. These cases are usually fatal.

In January last I was called to see R. C., male, age 12, who had been suffering from so-called cramp colic. He had been up and about all day. His breathing was rapid, pulse 120, and wiry; temperature, 99. Had several chills, and incessant vomiting. Patient looked like he had been sick for some time. Thigh flexed on abdomen, and would hardly allow an examination. Both recti were tense and there was no doubt as to his condition. No hope was offered his family, but they asked for an operation. A hasty operation was performed; found the belly full of pus, the omentum and appendix in a mass of adhesions. The appendix contained no concretions or foreign matter, but had gangrenous opening, which the omentum had apparently tried to wall off, but had been unsuccessful. The patient died in less than an hour. How Oschner can obtain such good results in such cases is a mystery to me.

APPENDICITIS, WITH REPORT OF CASES.

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Appendicitis, a disease which less than a score of years ago was practically unheard of, is now probably one in which the etiology and pathology is more thoroughly comprehended than that of any other disease of equal gravity with which the profession has to contend. It is a disease in which every phase and feature has been carefully studied and exhaustively discussed by the ablest men of a surgical and medical profession. Yet, unfortunately and strange though it may seem, there is probably no other disease to which the human flesh is heir, where there is such a great diversity of opinion as to the proper mode of treatment.

The literature on the subject is most voluminous, and much of it is characterized by ridiculously contradictory assertions.

To the young surgeon just entering upon the threshold of his career, who has delved deep into the present-day literature of this affection, and if, after so doing, he is able to logically arrive at a decision as to the proper method of procedure and feels sure that he is right and ready to go ahead, is indeed a prodigy. To do so, he must be a man who observes closely and profits by it. He must be a man of keen intuition, sound judgment, and possessed of a high order of diagnostic acumen.

Some of the writings on this subject border on the ludricous, as for example, one writer advises that after operating for appendicitis, the patient should be put to bed, giving as his reason for advocating this strange method of procedure, that rest in bed facilitates the healing process. No doubt but that the above advice embraces one feature in the management of these cases upon which all will agree, and should this writer travel extensively, he would,

in all likelihood, be surprised to observe how generally his advice has been heeded, and how completely his instructions are being uniformly observed by surgeons throughout the land. Another writer claims to have been so fortunate as to be allowed the privilege of observing a well developed case of the disease in a goat. In operating upon the animal, the surgeon claims to have found the heel of a rubber shoe firmly wedged in the appendix. Notwithstanding the precautions taken, the animal succumbed, but the surgeon feels sure that if he had operated a few hours earlier, the brute's life would have been saved.

To be fully convinced of the existence of the extreme diversity of opinion and practice respectively held and carried out in the diagnosis and management of appendicitis, by many of the best men in the profession, one has only to read a fair amount of the abundant literature on the subject. In arriving at a diagnosis, one writer will tell you that muscular rigidity is an important and prominent clinical feature in appendicitis, while another considers it of only secondary importance, naming a number of other symptoms which he holds to be of far greater significance and value in the diagnosis of this disease. Another, while admitting and commenting on the treacherous nature of the disease, noting the fact that cases often present themselves which are initiated by symptoms indicative of a much more grave condition than really exists. Continue your reading, and you will learn that the pulse and temperature are often especially misleading, yet a little farther on, the same writer will lay down a rule to be observed and followed, something like the following: If the temperature continues to rise and the pulse to increase in frequency after the first twenty-four hours, we are safe in advising that the case demands operative measures. Again, reading from another, probably equal eminent authority, you will find about the following: "In ninety per cent of all cases, nausea and vomiting are present and should be considered most valuable and important symptoms." Another: "Nausea and vomiting may be present, but are by no means constant." From another: "The pulse and temperature are of little value in making a diagnosis in

appendicitis." One writer asserts that pain in the region of McBurney's point is a constant and very important symptom of this disease, while another will tell you that tenderness in this region is a more constant and valuable symptom than pain. One well known surgeon who annually operates on hundreds of cases, advocates one form of drainage, while another who also operates on a large number every year, advises and uses another form, and even goes so far as to condemn that used by the first mentioned; and so we may continue our investigations and study of the products of the numerous writers on this subject, only to encounter a continued repetition of such apparently and in many instances really contradictory statements.

It is self-evident and goes almost without saying, that the inexperienced surgeon, whatever may be his mental capacity, and though he may be ever so earnest, persistent, and conscientious in his determination to imbibe sufficient knowledge of the subject to enable him to always act promptly and without hesitation, will be doomed to disappointment; and will find himself in very much of a quandary when brought face to face with a case of this disease, as to what course is the safest to pursue in order to best conserve the interest of his patient.

By reason of the fact that there exists this great divergence of opinion and contradictory statements in the writings on this subject, there are those who claim that the subject has been worn thread-bare, and the profession has become worried from reading so much from the numerous writers or being forced to listen to such prolonged discussions as are now being carried on regarding this disease. In my opinion, such a view of the situation is a grave error, and if accepted as true, would prove undesirable, unsatisfactory and very detrimental to the well-being and best interests of both profession and patient.

The complications and treacherous nature of this disease have demanded and received of those treating it, the deepest thought and closest study, yet it is frankly admitted that mistakes often occur on the part of those most skilled in the treatment of this

disease. A close reader of literature on the subject is led to believe errors in judgment, more especially as to when radical measures should be resorted to, are much more common than they should be; notwithstanding the fact that the erring one may be unusually skilled, careful and painstaking and probably also enjoy the invaluable privilege of superb clinical advantages whereby he has constantly before him patients in whom he is able to observe the disease in all its various forms and complications. If the most skilled too often make mistakes, what are we to expect from the young and inexperienced operator; one who has seen little and probably read less of the disease, and therefore does not fully realize the real gravity and the great responsibility devolving upon him when administering to a case.

It seems to me most clearly important that the question of diagnosis and the proper management of this disease should be constantly agitated and kept prominently and conspicuously before the profession by every legitimate means at our command.

In order to more clearly and forcibly illustrate the concensus of opinion among leading surgeons and physicians of today, I will quote briefly from a few of them.

Symes says "That death from appendicitis is due to the one thing, and that is, too late an operation. In every case of fatal appendicitis, there has been a period when every patient could have been operated on successfully and safely." Symes also wishes to be understood as considering appendicitis a purely surgical disease.

McBurney: "The number of practitioners who regard appendicitis as a medical disease, is rapidly diminishing."

Steel: "The mortality is less than 8 per cent during the first week and over 17 per cent during the second week, in operative cases."

Murphy: "By medical treatment, we have a mortality of 10 per cent, and we have 3 per cent by the knife."

Da Costa: "A large number of catarrhal cases are cured by medical treatment, but when the disease advances to pus formation,

surgical treatment is needed. If we err, let it be on the side of too early rather than too long delayed operation."

Deaver: "Excluding those in collapse, all cases of appendicitis should be operated on as soon as the diagnosis is made."

La Place. "In every case of fatal appendicitis, there was a time when, had the operation been performed, the patient would have survived."

Cartledge: "We should operate on every operable case as soon as the diagnosis is made."

Minter: "I have 5 per cent of recurrences after incision and drainage."

Porter has collected 177 cases treated by incision and drainage, with 13 per cent recurrence; though in his own series, he had only one recurrence in twenty-five cases.

Taylor and Morris advocate irrigating every abscess in suppurative appendicitis with hydrogen dioxide, followed by saline solution.

Paul Klen: "Catarrhal appendicitis should be treated medicinally and operation advised after recovery."

Barbat, in describing appendicitis, says that practically all patients who die after operation, we find at least forty-eight hours between onset of attack and time of operation; therefore, he says it is reasonable to assume that if the patient had been operated on inside of forty-eight hours, they would have been cured.

Grandin asserts that the less done after operating on appendiceal abscess and the establishing of drainage, the better for the patient.

Oschner thinks if patients suffering from appendicitis are seen during the first twelve hours, an immediate operation should be done, otherwise they should be left absolutely quiet; all cathartics and food by stomach are withheld; all nourishment being given by rectum. Stomach lavage is also advised when indicated.

Dawbarn believes the same discussions now taking place regarding appendicitis will occur twenty-five years hence.

The opinions here quoted are from among the most able men in

the profession, being the product of an experience resulting from the observation, study, operation and treatment of many thousands of cases. Almost without exception, it is agreed that appendicitis belongs more properly to the domain of surgery than medicine: a majority of writers also agree, and some of them assert most emphatically, that operative treatment applied to all cases, yields better results than medical treatment.

When to operate and when not to operate, we find a great diversity of opinion; an existing condition which bears out the contention made before, that although the profession possesses a large amount of knowledge concerning appendicitis, it has not advanced sufficiently to enable us to lay down any fixed rule as to when and when not to operate. The present status of the treatment of this disease is certainly not all that is to be desired, yet, such as it is, today some able men are inclined to believe it will be twenty-five years later; at least so far as it has to do with a classic symptomatology and a uniform method of treatment, are concerned.

The cases which I will report, in my opinion very aptly and forcibly illustrate the difficulties to be overcome; the great responsibility of the surgeon or physician in his efforts to draw conclusions and arrive at a decision as to what to do and when, if at all, it should be done. So far as they go, they also illustrate the fact that a certain group of symptoms of equal intensity, observed in two or more cases of the disease, does not by any means indicate that all are afflicted with the same form of the disease.

CASE 1. B. T., male, age 26 years, brunette, slender build, weight about 145 pounds. Patient had been residing in and about Beaumont all his life, and with the exception of a few malarial attacks, had always enjoyed good health. His first serious illness dates from the time he was encamped at Montauk Point, while serving in the capacity of volunteer soldier, during the Spanish-American war. Here he suffered from indigestion and a number of attacks of diarrhea. Returning home after a cessation of hostilities, his health improved and remained good until the first part of October, 1902. At this time he suffered a short and comparatively

mild attack of fever and diarrhea, the fever being pronounced by his physicians as malarial. During this illness he suffered for several days from obstinate vomiting, being unable for four or five days to retain anything except a very small amount of liquid, and often not that. His physician at this time, Dr. F. S. Martin, of Beaumont, tells me he would at times swallow several consecutive glasses of water, each one being ejected before taking another. This partook more of the nature of regurgitation than vomiting, coming away without effort on the part of the patient, yet he was apparently unable to prevent this action of the stomach. In about three weeks from the beginning of illness he recovered sufficiently to be able to leave Beaumont, going out in the country some twenty miles away, where he improved some but did not become strong; and in a few weeks was again taken down with fever, which was at first thought to be malarial, but later proved to be typhoid. About three weeks after the beginning of this attack, patient began to suffer pain in the region of the appendix. This pain continued to be more severe, and two weeks later the case was diagnosed as appendicitis. As the patient objected to operation and his condition not appearing alarming, his physician did not insist, deciding to await developments, so long as the patient's condition did not indicate an imperative necessity for operation. His condition remained practically stationary for about two weeks after the first manifestation of symptoms of appendicitis, and then began to slowly improve. In the interval a mass the size of a small fist appeared in the region of the appendix. This mass at first was exceedingly tender and somewhat painful. As the patient's general condition improved, this tenderness and pain became less marked, the size of the mass not appreciably increasing or decreasing. The patient's condition had now ceased to improve; although his fever left him, he was unable to sit or stand on account of weakness and pain, which such movement would provoke in the region of the mass. The above is an imperfect history of the case up to the time I first saw him, on December 29, 1902, at which time he had been referred to me for operation by his physicians, Drs. E. D. Pope and J. W. Swonger, respectively of Kountze and Hook's Switch, Texas.

On examination, I found patient's condition as follows: Temperature 99, considerably emaciated, tongue slightly furred, heart, liver, lungs and kidneys as nearly normal as one would expect to find them after such a prolonged illness. His pulse was 68 and unusually full and strong; facial expression, good. Patient had been taking quite a good deal of nourishment, and was in excellent spirits. The mass on right side was now about the size of a large orange, with half its diameter above the normal level of the abdominal wall, soft and fluctuating. As there was no necessity for immediate operation, the patient by reason of having made a trip of twenty miles by rail during the day, it was decided best to allow him to rest until the following day before operating. There was now very little tenderness on palpating the mass, and by being careful, it was not necessary to anæsthetize the patient while shaving and scrubbing the abdomen, preparatory to operating. The condition apparently demanded nothing more than a local anæsthetic, but as one can not often be positive in regard to what will be found in such cases, it was decided to administer chloroform. Accordingly, assisted by Drs. Pope and Swonger, the operation was done December 30, 1902. Observing the usual aseptic and antiseptic precautions, an incision one and one-half inches long was made over the mass. To reach the abscess cavity, it was only necessary to cut through the skin and an unusually thin layer of muscular tissue. About a pint of yellowish pus, of a not very fetid odor, was quickly evacuated, and as the cavity was perfectly walled off from the general abdominal cavity, the sack was flushed out with a warm saline solution, until the water came away clear. Only a few minutes was required for the operation, the greater part of the time being consumed in the preparation. As there was a considerable cavity, a strip of gauze was inserted for drainage, the usual dressing applied, the patient put to bed in good condition. On recovering from the anæsthetic, the patient expressed himself as feeling all right, except some slight nausea. On visiting him in the afternoon, his condition was good, except considerable nausea

and frequent vomiting. On evening of same day, his nausea had become less intense and he had retained a little fluid, the pulse, however, being 102. As a few doses of aromatic spirits of ammonia had partly relieved the vomiting, I ordered a hypodermic of 1-30 grain of strychnine, with instructions to repeat the ammonia if nausea recurred, and left the patient for the night, in care of a brother and a nurse.

I was called early in the morning, and to my chagrin, surprise and keen disappointment, found my patient in the act of dying, he living only a few minutes after my arrival. The nurse stated that the patient rested fairly well until midnight, when there was a recurrence of the nausea and vomiting. No alarming symptoms were noticed until a few moments before I was called. There was absolutely no distension of the abdomen. Temperature, one hour before death, 99; pulse, 120.

On account of the apparent splendid condition of the patient, and comparative insignificance of the operation to be done, I regret to say, a blood examination, which would probably have cleared up matters some, was not made.

CASE 2. J. R., age 38 years, merchant by profession, complexion fair, weight 190 pounds. This patient was suddenly seized one night with severe pains in lower part of abdomen, but not localized or more severe on one side than the other. He called a physician, and he gave his ¼-grain hypodermic morphia, and also prescribed a mercurial purge. On the following morning his condition had not improved, and he now complained of pain being more severe on right side. As stated by his physician, patient's temperature on day following attack was 102; the bowels not having moved, citrate of magnesia was administered, followed later during the same day by soap and water enema, after which bowels moved freely, and patient stated that he felt better. On the second night there was a recurrence of the pains experienced on the first and also considerable distension and rigidity of abdomen. The pain had now become much more severe in the region of the appendix and there was also extreme tenderness in the same region. Temperature 102.5. I

saw the patient on the third day after the beginning of illness, having been called in consultation with the patient's physician, Dr. T. B. Haynes, of Beaumont. Patient's temperature on this day was 103. Thick brownish fur on his tongue, pulse 110, tenderness over whole lower part of abdomen, being much more marked in the region of McBurney's point. There was also a marked rigidity of abdominal wall, together with retraction of right lower limb. If there was any mass in region of appendix, it could not be made out by reason of extreme thickness of patient's abdominal wall. Other symptoms of appendicitis were also present, and his condition was unmistakably becoming progressively worse. Hence, we did not hesitate to advise an immediate operation, as holding out for him the best chance of ultimate recovery. The mere suggestion of operation was enough to strike terror to this man and his family, and they at first positively refused to consider such a procedure; however, after further explanation, the patient finally consented to undergo operation on the following day; provided, there should be no sign of improvement. To this I was obliged to reluctantly consent; not neglecting, however, to impress on the patient that, in my opinion, such a delay was very injudicious and dangerous. On the following day his condition was much improved, and his recovery was rapid and uneventful. His health has remained good up to the present time.

CASE 3. L. P., oil well driller, age 26, an unusually strong and robust individual, being six feet tall and weighing 180 pounds. Previous health good. I was called in consultation with my friend, T. W. Beckman, of Beaumont, to see the above described patient on November 10, 1902. On Sunday, four days previous, patient stated that he felt somewhat indisposed, and did not attempt to work; he suffered some slight pains in abdomen, also considerable nausea. On Monday following his suffering had become more intense, and a physician was called, who stated to me that he found the patient with a temperature of 101, pulse 95, thickly furred tongue, nausea and some vomiting, with pain and tenderness over whole of abdomen. A mercurial purge was prescribed,

followed by quinine and a saline, if necessary. On Tuesday, the third day from the beginning of illness, the doctor was again called, and found the patient with a temperature of 102, pulse 98, with other symptoms as described above, only considerably exaggerated. The doctor stated that the tenderness over the abdomen had increased very much in intensity, especially on right side, in region of appendix, where it was apparently becoming localized. The physician deciding that an operation would probably be necessary, had the patient transferred to the Sisters Hospital in Beaumont, Texas, where I saw him on Wednesday, the fourth day after beginning of illness. His condition at this time was as follows: Considerable distension and rigidity of abdominal wall, marked pain and tenderness in region of appendix, where a mass, the size of a small fist, could easily be felt. Patient's temperature was 102, pulse 110. Nausea, but no vomiting for twelve hours. Pain in region of appendix had become very intense, requiring morphine at four to six hour intervals. As the patient's condition had been constantly and rapidly growing worse from the first, it was decided to advise an immediate operation. This was done, and the patient consented to have it done as soon as possible. Dr. T. W. Beckman assisting, and Dr. R R. Sullivan administering the anæsthetic, the operation was done on Wednesday evening following the beginning of illness, on the previous Sunday. The usual incision was made over McBurney's point, which was also directly over the mass. On reaching the peritoneum, it was soon evident that the adhesions, if any, were not very firm, as coils of intestines could be distinctly felt passing beneath the finger and pressing upward into the wound. On opening the peritoneum, more than a pint of sero-purulent discharge escaped, which possessed a distinctly fecal odor. In fact, the last of the discharge to come away was mixed with fecal matter. The adhesions only partially protected the general cavity. The cæcum was bound down and omentum adherent at several points. On careful exploration with the finger, it was found that the appendix had already sloughed off, leaving a small opening in the cæcum, from which its contents were slowly oozing. During this

exploration every precaution had been taken, by careful gauze packing, to prevent, as far as possible, the soiling of the general peritoneal cavity. On further exploration with the finger, a mass, the size of a medium sized orange, was found lying somewhat behind the cæcum. It was freely movable to a limited extent in all directions, except upward through the wound. This mass proved to be the missing appendix, which was more than half enveloped by the omentum, and held in position by part of its own mesentery. As the omentum was so firmly attached that it could not be separated from the mass, ligatures were thrown around it in sections, and after tying the mesentery of the appendix, the mass was cut away with the scissors. On examination, what was once a normal appendix was now the size of a hen's egg, soft in consistency, and almost black in color, with three perforations, from which pus was oozing. An attempt was now made to close the cæcal opening, but without success, as its walls were so friable that the least tension would cause the sutures to cut through, leaving the condition worse than before. Failing in this, we decided to pack, as carefully as possible, around the perforation, and thus to a certain extent at least, protect the adjacent parts from the discharge. The gauze was introduced in such a way as to leave a tubular passage down to the cæcal opening, thus making a free exit for the fecal discharge. Silk worm gut sutures were used in closing the wound. An opening, two inches in length, was left in the central part of the wound for drainage purposes. While great care had been exercised in protecting the abdominal cavity, and its contents not already involved by the disease, it had not been altogether successful. During the progress of the operation, distended coils of the small intestines presented in the wound more than once, and that they became soiled, goes without saying. Although great care was exercised in cleansing them, they could not possibly be scrubbed to that extent one would wish one's hands to receive before introducing them into the abdominal cavity. The usual outside dressing being applied, patient was sent to bed in good condition. Considering the extremely rapid progress of the disease in this case, together with

the possibility of, more correctly speaking the probability of, general infection, a grave prognosis was made, his relatives being told that the chances for recovery were much against him. To our surprise and gratification, the patient's recovery was unusually rapid and uneventful; there being no temperature, abdominal distension or discomfort, save that resulting from the dressings becoming saturated with pus and fecal matter, which necessitated frequent changing. The fecal discharge remained about the same until the fourth day, when it began to rapidly diminish, and by the tenth day had entirely ceased. Patient left hospital four weeks after operation, and could have gone much sooner, but he wished to return to his home, some few hundred miles distant, hence the delay. A slight fistulous opening from the abdominal wall persisted for some time, but closed some five weeks after the patient left the hospital.

THE GROSS AND MICROSCOPIC ANATOMY OF THE VERMIFORM APPENDIX AND THEIR BEARING ON APPENDICITIS.

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So many, indeed, are the logical anatomical reasons why appendicitis should be a common affection that those who have given the matter much study are very apt to wonder why it does not occur even more often than it does.

In the first place, comparative anatomy shows that the appendix vermiformis of man is the relic of a very large cæcum in some of the lower animals; and it is a matter of common knowledge that organs or tissues which are retrograde remnants instead of advancements have little resistance, and are prone to become diseased on the least provocation.

Secondly, take a glance at the lumen, and note that it is quite small, even in proportion to the size of the organ; hence drainage into the cæcum (of the utmost importance normally, but in diseased conditions especially) is not of the most perfect kind. Furthermore, where inflammation is present, the drainage will be still less, because the lumen becomes still smaller. Add to this the fact that constrictions are very apt to occur in different portions of the canal, and we have even a worse condition still from the standpoint of drainage.

A third factor, and one to which special attention must be called, is the great amount of lymphoid tissue which is found in the appendix. This form of tissue occurs to some extent in other parts of the intestinal tract, but not by any means to the extent noted here. Indeed, its presence here might be compared to that found in the tonsil (faucial). Wherever it becomes necessary to protect the system against the invasion of foreign particles, disease germs for

example, nature has met the emergency by providing lymphoid tissue as a barrier. This is usually in the form of lymphatic glands, but may be specialized as in the tonsil and appendix. On account of its exposed situation, probably more than on account of any special proneness to inflammation, this lymphoid tissue often becomes the seat of inflammatory and ulcerative processes; and, under these circumstances, it manifests a capacity to increase in size in a very short period of time, bringing about a condition of great swelling, which, however, may disappear just as quickly as it was formed. Thus, no doubt, can be explained the frequent cases of severe tonsilitis. These are manifested by marked rise in temperature, embarrassed breathing from enlargement of the tonsils, great pain on the least attempt to swallow, and a large, red tumor mass projecting from each side of the fauces, and which may be covered by a cheesy or membranous exudate. These symptoms may be so acute that the patient takes to his bed, and refuses all food for two or three days on account of the pain of swallowing. But just as definite and rapid as the oncome of this condition of affairs is the rapid and complete return to a state of normality. For, indeed, in only a few days the picture may be quite different—no fever, no pain on swallowing, but pulse natural, swelling and redness of tonsil gone, and patient comfortable. Compare with this the similar features of acute appendicitis with the rapid rise of temperature, severe pain, which may or may not become localized, and the marked constitutional disturbance as in tonsilitis. Here again, after such symptoms of danger have passed, if the appendix be exposed by incision, the surgeon is very likely to find not an inflammatory mass of adhesions and a large red appendix, but, in a large class of cases, a very normal and inoffensive looking little organ. What has happened here, and analogously also in the tonsil, is that the swelling of lymphoid tissue has subsided, and in consequence (in the case of the appendix) the circulation, which had been impaired because the lymphoid tissue was tightly bound by the peritoneal coat, has greatly improved, the lumen is restored once more, and good drainage is insured. (See plates for distribution of lymphoid tissue.)

Another anatomical feature that undoubtedly bears on the etiology of the disease is the arterial distribution. The appendix is mainly nourished by a single artery, which runs in the free edge

of the meso-appendix. This is a branch of the ileo-colic artery, and when the mesentery of the organ is lacking, as it sometimes is, it courses under the peritoneal coat. This vessel has no important anastomoses, or is, in other words, a terminal artery. Especially is this the case towards the free end of the organ, the situation where necrosis, sloughing and gangrene are most apt to occur. As shown in the accompanying plates, the number of vessels is large, and these are quite widely distributed; it is the fact of terminal arterial circulation that is responsible, for if collateral trunks were present the appendix could the more easily combat inflammatory tendencies.

Finally, disease germs (streptococci, colon bacilli, etc.) are always on hand, as well as foreign bodies (fecal concretions usually, but occasionally seeds, particles of metal and the like), and in a mucosa and submucosa that are so prone to undergo progressive degenerative changes, the above irritants are provided with just the proper pabulum for establishing an inflammatory process.

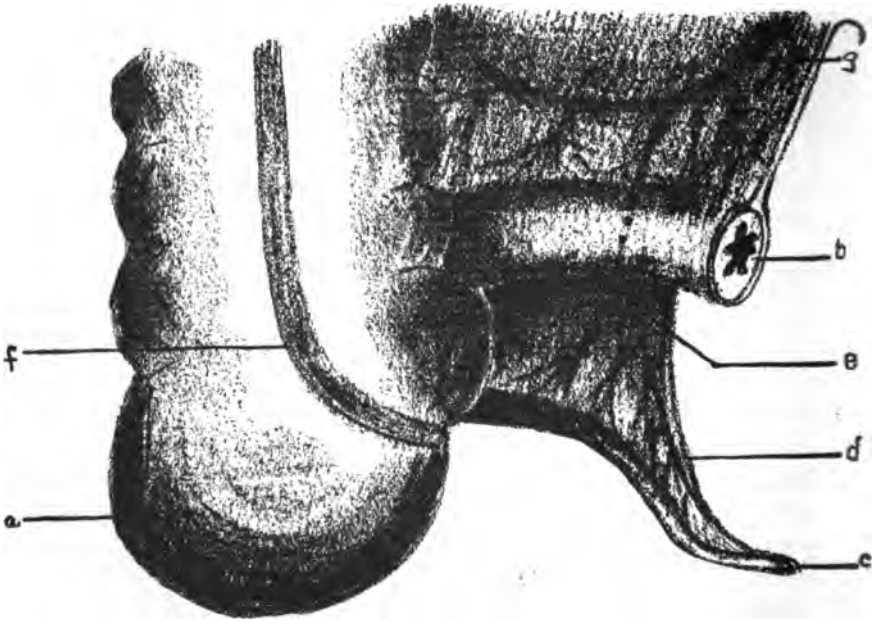

FIG. 1. Showing cæcum (a), ileum (b), appendix (c), meso-appendix (d), artery to appendix (e), anterior longitudinal muscular band of cæcum (f), ileo-colic artery (g). Points of surgical interest are that the artery to the appendix runs in the free edge of the meso-appendix; and the three longitudinal muscle bands of the cæcum will always lead to the vermiform appendix. Only the anterior band seen here.

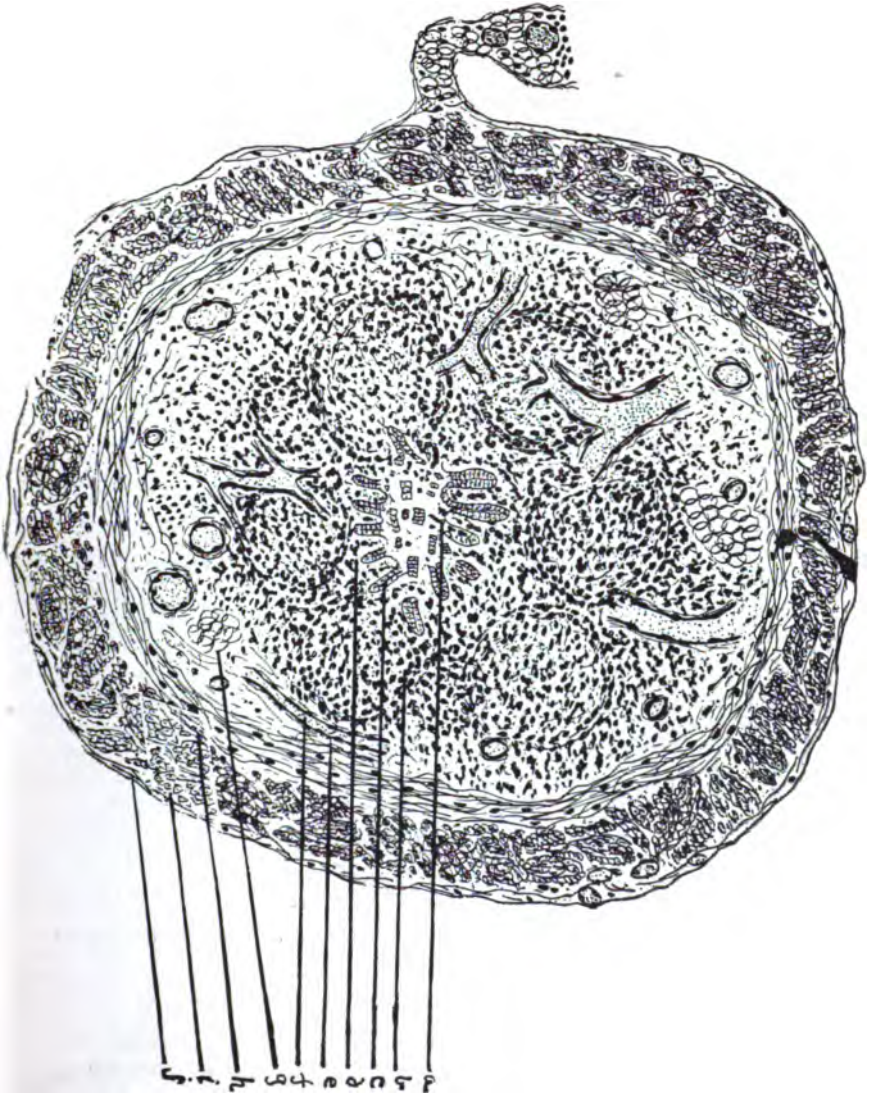

FIG. 2. Showing minute structure of the average dissecting-room appendix. The lymphoid tissue (b) no doubt shows some hypertrophy. Its arrangement in the form of nodules can be noted. At the lumen (a), are seen Lieberkuehn's glands (c), encroached upon by the overgrowth of lymphoid tissue (b), and somewhat disrupted. Mucosa (d), submucosa (e), blood vessel (f), fat (g), circular muscle (h), longitudinal muscle (i), peritoneal coat (j).

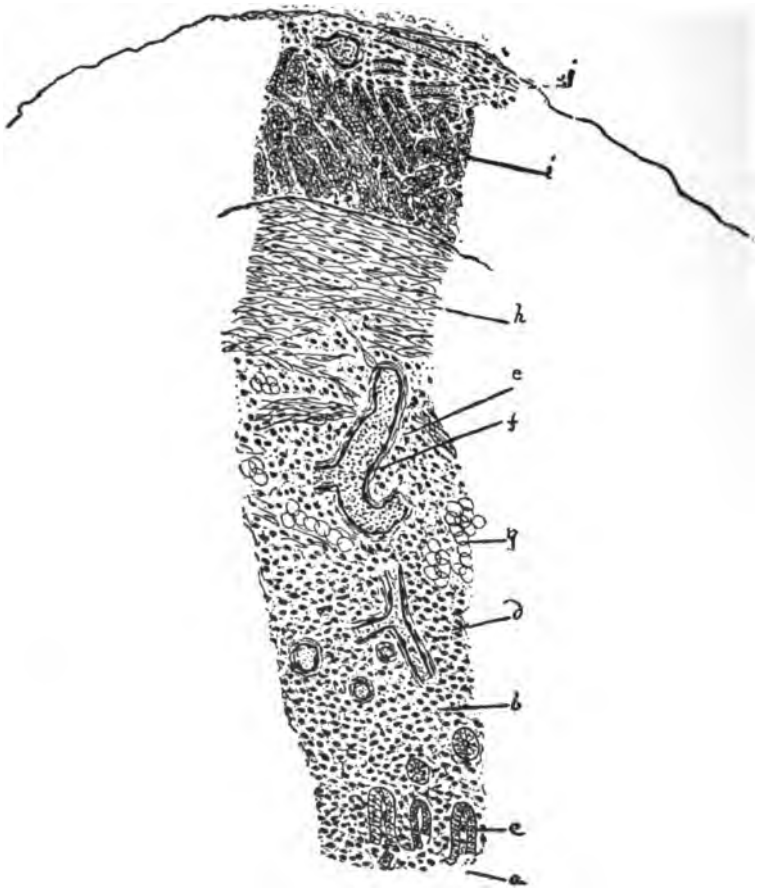

FIG. 3. Showing same appendix more highly magnified. Lettering same as in figure 2.

DISCUSSION.

DR. H. W. CROUSE, Victoria: In appendicitis, the nicest surgical discrimination presents itself to a surgeon in deciding when and when not to operate. There is no analagous surgical condition which is its equal. We have this difficulty presenting itself with frequent pulse and rather high temperature, with marked pain, peritoneal pulse, nausea and the classical

signs of suppurative conditions; but, on operating, we discover instead a merely catarrhal inflamed appendix to exist. Last November, while in St. Louis, a discussion arose between Dr. Bernays and myself as to what were the inducive causes of death in catarrhal cases, where, post-mortem, no septic conditions were found. Dr. Bernays stated to me that he had often found, of late, that the lymphatic glands, a group of which Dr. Keiller informs me lies behind the appendix and act as an appendicular drain, also another group which lies between the angle made by the conjunction of the ilium and colon, are frequently found to be suppurative. Analagous to the suppuration that takes place in the inguinal glands in gonorrheal or in chancroid cases, Dr. Bernays stated that he had seen several cases, post-mortem, where these glands, on being carefully examined, were found to be slightly congested externally, and when incised were replete with pus. This conclusively proves the reason why we, at times, have the misfortune to have a catarrhal appendicular case terminate fatally, and should we surgeons but delve beneath the appendicular area and investigate the glands, removing them if they are found to be suppurative, we should, in all probability, at many times, save cases which, at present, we lose. Dr. Bernays showed me a little plan that he had for removing pus from deep pockets, which Howard Kelly has added to his revised edition of "Operative Gynecology," namely, the use of a glass tube, a simple pipette, by means of which he was able to withdraw pus from deep cavities that would have been difficult to have been cleared in any other way.

DR. W. B. COLLINS, Lovelady: I would like to make this point in regard to these cases. Although we are not surrounded by the best environments, and we do not have hospitals, trained nurses, expert anesthetists, etc., at our disposal, their absence alone should not cause us to decline to operate. The great desiderata are these: Can we do the operation aseptically and antiseptically? Upon our ability to do clean operations, our success depends. I think we can prepare our water just as sterile, make our solutions just as accurate, and clean the field of operation just as well in the country as in town. These are the main questions for us to decide. I speak of the disease strictly in a surgical sense. First decide whether or not an operation is imperative to save life, and then proceed without hesitation to do it. We should not throw up our hands and surrender because we have not the best facilities for operating. A little heroism among the profession will result in great good.

DR. T. P. WEAVER, De Leon: I just want to say that I was glad to hear what Dr. Crouse said with reference to our disability in caring for our patients; that we are often called to those cases that are removed from hospital advantages and the benefit of a trained nurse and a great many other

things. In our practice as medical men we are called to see a man may be a number of miles from any trained nurse or hospital, say in the country; it becomes our duty just as often perhaps to see a case of appendicitis, and a case which demands immediate operation, as in the city physician's practice, who has a trained nurse and a hospital at his back. Now, I want to say that I believe that it is as much our duty, even if we are fifty miles from the railway, hospital or trained nurse, and that if proper aseptic rules be carried out, and if he is satisfied that his diagnosis is correct, I say that it is the duty to give that patient to the best of his knowledge the best treatment and select the course that will result in his recovery. Now, if he needs an operation, we can prepare for one in the country; we know how to asepticise our hands and how to have the patient prepared, also how to sterilize our gauze, ligatures and instruments and see that everything about the patient and room in which we operate is prepared in a few hours, and we can do a comparatively aseptic operation and save the life of our patient. It is not right to lay our hands down and say, if this patient was in a hospital in San Antonio, Austin or Waco, his life could be saved; but do the best thing that we can for our patient, and with a pure atmosphere and no contamination from germs, we will get just as good results fifty miles in the country as though we were in the city; and if we work along this line, our success will compare favorably with almost any man in the city.

DR. J. H. REUSS, Cuero: In the paper of Dr. Decherd, referring to the anatomy of the appendix, did I understand him to say the muscular structures and the lymphatic substances were markedly increased at the base of the appendix, and the muscular structure less well defined as it approaches the apex? If this be the case, we can readily understand the entrance of any foreign substance or infection entering the appendix being cut off from a return drainage to the bowel on account of the increased constriction at its base, and this "damming up" in the caliber of the appendix in turn producing an increasing catarrhal inflammation.

DR. J. M. NICKS, Stone City: In regard to these operations. We are frequently called to a case and find it to be appendicitis, and will urge an operation. The country people as a general thing fear the knife. I have seen numbers of cases where at first conditions were not grave. I would hesitate in these conditions to do an operation. I would wait for a day or two, see the condition of my patient getting serious, and would say to the people that we had better have an operation. But they would hesitate, express their views and fears, and hold back with the hope of his getting better. Sometimes bad cases get better without an operation; but if the case is in articulo mortis we then are at the point when an operation would bring disrepute upon ourselves.

Sometimes we have to say: "I take my hands off this case if you do not give me permission to operate." We have our reputation at stake in these matters, and frequently some member of the family, or somebody else, puts his opinion against the doctor's. We have the case, and he needs an operation to get well. We get the consent of part of the family to operate. We do the operation and he dies. We have just killed ourselves in that community. The best thing to do in a case of catarrhal or other severe form of appendicitis is to give the patient for a sufficient length of time the benefit of medicinal treatment, and if we find that there is likely to be a fatal termination, we must then and there decide what to do. If they say no, we should refuse to treat the case longer.

DR. F. D. GARRETT, Gainesville: I think there is a favorable time in these cases to operate, and an unfavorable time. I believe that in every case of appendicitis it is best to inform the patient that an operation might become necessary. I believe there are some cases of appendicitis, particularly of the catarrhal form, in which it is better not to operate, better not to advise operation. Cases which are very mild, in which the patient has a little pain, no temperature or a very little temperature, may be safely postponed. If he has a recurrence of the same trouble, it is better to advise operation; but if the attack is still mild, wait until he recovers from it, then perform the operation during the interval of time which intervenes between that and the next attack. There is another class of cases of a virulent type, with rapid pulse, high fever and great pain, a malignant form of appendicitis. In this class it is our duty to do an immediate operation and the sooner it is done the better for the patient and all concerned, and I would advise immediate operation. If they did not consent to the operation within the first thirty-six hours, the physician ought not to risk the life of his patient and his reputation by operating. Of course, there will be exceptions to this, but as a rule, where those cases are postponed over thirty-six hours, on opening up that patient's abdomen, you break up adhesions which might have formed if you had postponed the operation, and you deprive the patient of nature's protection, which, at this late hour, is his best friend. By way of illustration, I can cite from my own practice two cases which I recall now. One of a mild type, of a catarrhal form, in a young lady, a school teacher, about twenty years old, who had attacks of appendicitis following each other at intervals of a month at first, then two months intervened, having in all five distinct attacks. They were very mild, except the last one that she had, from which she suffered a great deal. On account of these attacks coming just about the menstrual period, there was some little doubt about the diagnosis, but I felt very sure that it was appendicitis. When she had the fifth attack she was out of the city and when she came back home I advised her to be operated on, and she submit-

ted, and got along all right. The second case was a little boy about five years old. I was called to see him about one o'clock at night and found him suffering intensely, temperature 105, pain all over abdomen. About three or four hours later when I called the pain was localized at McBurney's point. I advised operation next day, and the family consented, just twelve hours from the onset. We operated on the boy and found and removed a gangrenous appendix. The boy recovered.

I merely wanted to try and bring out the point that there was a favorable time in these cases to do an operation and again an unfavorable time.

DR. WM. KEILLER, Galveston: Within the last twelve months Dr. Ochsner, of Chicago, has written a hand-book on appendicitis, which is a landmark in the treatment of appendicitis and will answer the question: What to do when operation is impossible. I think upon the whole Dr. Ochsner advises that if you can not operate in the first twenty-four hours you should follow the treatment that he outlines. It is impossible to epitomize what he says, but as nearly as possible he gives absolute rest, washes out the stomach, gives absolutely nothing at all—not even water—by the mouth, and feeds entirely by the rectum until the symptoms have subsided, and then he insists upon operation; and if he can not get it, he washes his hands of the case. I advise all who have not seen the book to get it without delay and read it.

DR. H. A. BARR, Beaumont: It is interesting to me to note that in the discussion of this disease by members of this Association there exists practically the same difference of opinion as to what to do and when to do it, as is found among the greatest operators of our country. This same question has been asked by the leading physicians and surgeons in the land. Now, we have no uniformity of method as to what and when to do it. We have cases of appendicitis attended by mild symptoms, and the patients go on and get well; then, again, there are cases, for instance in my own town today, among men that I have seen that have suffered from appendicitis and are apparently well and able to discharge their duties as business men; there are many others, also, that are in the grave who had mild symptoms, just about the same as the others apparently. Many were advised to be operated on, but refused, and recovered without it. I have told their friends that they have to be careful. Two or more cases may have exactly the same symptoms, and one may die and the others may not.

In regard to these cases and the anatomy of the appendix, I think it is generally recognized that infection takes place through the lymphatics. The appendix is generously supplied with lymphatics, hence peritonitis takes place from a very small focus inside the appendix.

You may be called twelve hours after the inception of the attack, and

when you reach him he is much better; there has been an amelioration of the symptoms, and so he refuses operation, and may be at the same time you have a gangrenous form of appendicitis to deal with. I do not think we should be guided entirely by the symptoms, as you all know they are often misleading.

In regard to one of the gentlemen speaking about operating in the country, and not being able to observe aseptic or antiseptic precautions, I think he is somewhat mistaken. The only advantage of a hospital is its increased facilities, both to the operator and patient, that is all. We can operate in the country on these cases, and look after our asepsis or antisepsis, too; and if you have not sufficient assistance, you can get help, though it may be unskillful, and often save your patient, where by waiting to send away for a surgeon they will probably die.

DR. FELIX P. MILLER, Midland, said, in closing: I want to say that I agree with what has been said in the main, but just a few questions I want to answer Drs. Weaver and Nicks, as regards the country cases. Not many of you live any more in the country than I do. I am three hundred miles from Fort Worth. We have no hospital near us, but we have prepared a place where we can give our patients fairly good opportunities for recovery, in case we have to operate. Just be careful as to sterilizing everything that you are going to need. We have four physicians in our town; we can all help one another. We had a case of acute suppurative appendicitis and needed help, so got a trained nurse from Fort Worth. As to our fear of the laity from censure regarding operative work, we should never hesitate on that account.

This case, R. W. C., I do not say he got well, because I do not believe he is well. I insisted on an operation, and I believe it would have been the best thing; I am sure he is going to have another attack, because he has been uneasy in that region ever since. He is away now from the surroundings that give him a favorable chance of recovery, and when I have insisted on operations, I have never had the laity to censure me; that is what they employ me for, to give them the best advice I can, and if I do not, they have a right to censure me. It seems that the laity are becoming more educated regarding appendicitis than some of the physicians. I would advise Dr. Jenkins to read Dr. Ochsner's book; it is well worth the expense, and it will help him to answer some of the points that he is in doubt about and that we have been discussing. When you have a case of suppurative appendicitis, how do you know what is going on in that abdomen from the symptoms alone? You will never find two cases with exactly the same pathological conditions.

DR. J. F. Y. PAINE, Galveston: In one of Dr. Barr's cases he referred to

the tissues of the appendix as being so friable from inflammatory changes as to make it impossible to close it by suture or ligature, consequently packed around the aperture with gauze for the purpose of drainage. I had a similar case last year, one of suppurative appendicitis complicating pyosalpinx on the right side. After removing the tube it was found that the tissues of the appendix would not sustain either a suture or a ligature. The appendix was, therefore, ligated as tightly as the tissues would stand, cut off, leaving a short stump, and turned into the cœcum and the walls of the cœcum closely approximated over it by a sero-serous suture. The result was in every respect satisfactory. I can not recall the author of this suggestion.

RUBBER IN WINDOWING PLASTER CASTS IN COMPOUND FRACTURES.

HUGH CROUSE, M. D.,

VICTORIA, TEXAS.

The necessary immobilization in treating compound fractures induces marked difficulties in securing aseptic results. Plaster of paris windowed to secure drainage is replete with septic possibilities. The constant discharge, the moisture of copious flushing, together with the warmth of an inflamed limb, gives us the triad needed for rapid bacterial development. Three years ago, while treating a compound fracture of the tibia, induced by direct force where extensive laceration existed, excessive fragmentation of the bone also being present, the Gross treatment resulted, despite constant assiduous care, in septicæmia, fatal in its extent. A week or two after this unfortunate experience, being called to attend a gentleman aged sixty-six, suffering from a compound fracture of the tibia, induced by the kick of a horse, on noting the extensive laceration of soft tissue, the septic condition of the wound and marked comminution of the bone, I attempted to utilize a suggestion made me by a dental friend, Dr. George Tyng, of Victoria, namely, the packing of dental crown rubber, known to the trade as Samson's No. 2, in windowing the cast on redressing the case the following day. Fragments of rubber were cut and placed in commercial chloroform, sufficient of the latter being used to form a semi-gelatinous paste. Absorbent wool was worked into this until a meshed mass resulted. Taking strands of this rubber-laden wool, the plaster cast having been windowed sufficiently to give an inch of healthy uninjured tissue around entire circumference of the wound, the skin having been previously shaved, sterilized and well dried, layer after layer were rapidly packed by the aid of a dural elevator between the cast and skin until at every point a snug filling

existed. Then, by using a plain chloroform solution of the rubber, the entire area was rapidly veneered until a smooth rubber mass extending from near the wound margin well out onto the cast existed. The entire cast was then shellacked, the wound within a few moments being aseptically flushed and then packed with a 5 per cent iodoform gauze, as a drain, covered as usual in handling wounds with sterile gauze and cotton, bandaged, and the limb reswung to afford chance of change of position. For the first two weeks the dressings were removed daily, the wound copiously flushed with weak, antiseptic solutions and dressed antiseptically. Subsequently, on alternate days, the wound was dressed. The temperature of the patient came rapidly to normal, and remained so. Eight weeks later the cast was removed and was found to be sweet, clean and dry. The absorbent wool and bandages about the limb and interior of cast were not charged with wound discharges and were free from the usual foul odors, filthy appearances one is accustomed to find while using the cast as illustrated in cut No. 1, recommended by Helferich, Gross, Wythe, Hamilton, Estes, Stimson, Keys, Jr., and others. Further experience has led to but few modifications of the original method. In some cases, where the wound is extensive, necessitating wide windowing, I strengthened the cast, by not alone doubling back and forth the plaster bandage, but re-enforced this with two or three pieces of No. 10 to 12 telephone wire. The exact location of wound and extent of windowing is indicated by taking a couple of pieces of tin, having them X-jointed, then four other pieces formed so as to slide over the ends, these sliding parts being perforated on the top to permit the passage of a pin. These are all sterilized with the instruments used in the primary handling of the case. After the wound is dressed, the limb shaved, vaselined, covered with absorbent wool, the latter being preferred to cotton on account of its resiliency, despite moisture, the X-jointed tin strips with their tin-laden sliding pieces are placed, the slides slipped to give the area you desire to cover in windowing and the cast put on with the usual precautions, care being taken alone in allowing the pin points exit to secure their aid in locating the

amount of healthy space desired about the wound on opening the cast the subsequent day. After the cast has been cut around the pins which can indicate a narrow or wide space by simply spreading or closing the X, the strips are caught at the joint, bent, and the ends readily removed from under the cast, by traction. Instead of shellac, lately I have been using silex, a liquid glass. Dr. Hoff, of Ann Arbor, Michigan, Professor of Dental Surgery in the University of Michigan, has used rubber for several years in handling compound fractures of the inferior maxillary, windowing from the inside of the mouth. I have used the technique I have described in several types of cases outside of compound fractures, such as Anderson's spit operation in correcting severed tendons, such as the tendon Achilles and the extensor tendons of the hand, also exsecting operations about tubercular joints with marked success. In comparison with the old methods, the cast as heretofore used demanded frequent changing, each time endangering the position of the re-uniting bone, on account of the accumulation of discharges which frequently induced skin necrosis and resulting ulcers; the casts were septic and malodorous; double windowing being demanded for counter drainage; a puncture being forced upon one in order that the tube should have a dependant point for drain. This method is septic, permits exact windowing, permits frequent inspection, does not demand cast removal until bone continuity is seemingly good, is cosmetic, delivers us from penetrating healthy tissue for counter drain, allows copious flushing,—the ideal treatment in septic wounds,—permits constant immobilization, does not demand frequent change. I do not claim exact originality in this technique. I simply commend it to you and ask a trial of the method.

DISCUSSION.

Previous to reading his paper, Dr. Crouse said: Gentlemen, in this paper I do not claim to be original exactly, because I believe that Dr. Hoff, Professor of Dental Surgery in Ann Arbor, Mich., has utilized this method before me in handling fractures of the inferior maxillary. As far as I am able to discover, though, he has never published his technique; but I wish to give him credit for it, nevertheless.

DR. H. A. BARR, Beaumont: I enjoyed listening to this paper very much, and wish to say that about six months ago I had two cases of compound fractures and did not get very successful results on account of infection and sloughing, and during that time I attended a meeting at Houston, and Dr. Crouse suggested his method to me. I wish to say that I have tried it on three cases and I am certainly well satisfied with the result, and I believe that this method, as soon as it becomes well known, will take the place of all other methods in these compound comminuted fracture cases. We often have a considerable amount of tissue which is torn and bruised to such an extent that it is devitalized apparently, and will die despite the greatest care on our part to prevent it.

DR. CHAS. WARDELL STILES, M. H. S., Washington, D. C.: I do not wish to discuss this paper from a surgical point of view, but I should like to enter a mild protest against a certain principle which Dr. Crouse has advanced. It is a recognized principle in science that the person who first describes an object or a method is its author. In the case at hand, Dr. Crouse, owing to his excessive modesty, now generously steps back and gives the credit for this method to another person. I do not think that the Texas State Medical Association should permit him to do this, for from the evidence he himself has given Dr. Crouse is the first person to make his method public; therefore, he is the first person to describe it, and hence he is the discoverer.

Dr. Crouse has said that he has met another man who, it seems, used this method on another operation before Dr. Crouse used it. But this other person did not make it public, hence he can not be admitted as the discoverer. The principle Dr. Crouse advances is one which has given rise to some of the most bitter discussions that have taken place in the medical profession.

There is only one principle that can justly be followed in such matters, and it is the principle of actual publication. The man who publishes his discovery first in print is the discoverer of the method; it does not matter if some other man has thought of this for eight or a thousand years; it is not public property until it is published, until it is printed and given to the entire world, and it makes absolutely no difference that another man has thought of or used the same thing; he has not given the world the benefit of it, therefore he is not the discoverer of it.

I well recognize the fact that these views are not held by all members of the medical profession. But it frequently happens that as soon as you have made an important discovery, you will find that some other man from another part of the world says: "Why, I made that discovery ten years ago." There is a proper principle upon which a fair test should be based, and that is, that every man should come forward and make his discovery

public and publish it. Therefore, I want to enter a mild protest against Dr. Crouse's exceeding modesty in this matter and to state that from the evidence which Dr. Crouse gives in connection with this method he discovered it independently, he is the first to make it public, and, in my opinion, he is the discoverer and should have the credit of priority.

DR. WM. KEILLER, Galveston: I think the method an excellent one, but I would take exception to one point, and that is that I would not shellac the whole splint; I would shellac all the plaster cast that has to come in contact with the discharges; as to the rest of it, I think one advantage of the plaster cast is that it admits of free evaporation and keeps the skin dry, and if you shellac the whole cast you lose this. I would rather use boric acid upon the skin in preference to vaseline, as it will materially interfere with the action of the skin, and boric acid does not so interfere with the perspiration and the cast could remain on for an indefinite time.

DR. F. P. MILLER, Midland: I do not understand how Dr. Crouse describes his packing. Was it put beneath the splint, and how did he avoid the pressure?

DR. H. W. CROUSE, said, in closing: I am decidedly obliged to Dr. Stiles for his statement when he remarks that he believes that I should have the credit because I have published the principle of this technique for the first time. As to that, it is immaterial. All that I wish to do is to bring this method to your attention, and to commend it to you, assuring you that my experience has proven it to be worthy of use in compound fractures, where windowing is desired. There was one thing that I had never thought of, and that was the point brought out by Dr. Keiller, as to shellacking of the whole cast. I readily see the point he makes relative to the escape of moisture through the ordinary plaster cast, and the prevention of such taking place where an impervious substance is used over the entire cast. I only shellacked to prevent the water, which always gets on your cast, from crumbling the plaster, and, of course, succeeded in doing so by means of this veneering; but, as Dr. Keiller says, it permits of no evaporation taking place, so, perhaps, it would be better that we simply cover a sufficient area in order to guard against the splashing of the water used in irrigating the wound. This method I have been using for three years, so it is backed with considerable experience. I have handled, as I have mentioned in my paper, several types of cases sucessfully.

EXTRA UTERINE PREGNANCY.

J. S. McCELVEY, M. D.,

TEMPLE, TEXAS.

In writing a paper on above subject, I have nothing new or startling to offer the profession, but only attempt to give a concise description of the most salient points one is liable to encounter most any day in practice. This condition is relatively rare and dangerous symptoms so liable to suddenly occur that if the attention of the practitioner is not occasionally called to it, the diagnosis and treatment might be temporarily overlooked.

Pregnancy may occur anywhere outside of uterine cavity, from the internal ostium of tube to the ovary, and probably, also, in the peritoneal cavity itself, though the latter is still a mooted question. The most frequent place of development, however, is in the tube and the most frequent part of the tube is the ampulla, hence I will discuss only tubal pregnancy, and that within the first four months. When pregnancy takes place in the tube, it undergoes the same development as when in the uterine cavity. The fecundated ovule implants itself on the M. M. of the tube and the M. M. begins to grow and envelop the ovum. There is formed a tubadecidua serotina, vera and reflexa. The chorion of the ovum begins to throw out the villi and later on with the villi of the serotina, the villi of the chorion form the placenta, provided rupture or abortion does not take place beforehand. The walls of the tube also thicken and the muscular tissue hypertrophies, but on account of the further development of ovum, the walls become stretched and thinned down and finally rupture. The rupture (and sometimes abortion into general cavity) occurs generally in the first four months, most frequently about the fifth and sixth week. It is very rare that the pregnancy is completed. The physician seldom gets to examine the case before disturbances arise unless by accident, as the woman holds herself far pregnant in the natural way. It is at the time of rupture the

physician is called upon for a diagnosis, and it is at this time he must diagnose accurately and act promptly.

The actual cause of this abnormal condition is not definitely known, but it occurs more often in nullipara, who have been married for several years without becoming pregnant, and multipara, who have not borne a child for a long period. It is also supposed that peritonitic processes have something to do with it by displacing, kinking or narrowing the humen of the tube. Inflammation of the M. M. of the tube and polipi may also be causes. At times, too, the fecundated ovule may wander from the uterine cavity, or may be in the tube and can not pass back through the narrowed tubal ostium into the uterine cavity.

The symptoms are the same as those of normal pregnancy until the time of rupture, such as nausea, vomiting, enlarged and discolored breasts, cessation of periods, enlarged uterus, blue discoloration of vaginal M. M. and pulsation of uterine arteries, but as the physician seldom has an occasion of making a diagnosis before then, I will discuss only the symptoms of rupture.

If the rupture occurs in the general peritoneal cavity, the patient is suddenly taken with excruciating, sharp, cutting pain in lower abdomen, attacks of syncope, great pallor, sighing, respiration, intense thirst, rapid running, feeble, small pulse, cold extremities and profuse perspiration. If the rupture occurs not into general peritoneal cavity, but between the folds of the broad ligaments, the shock is not so great and comes on more gradually. The menstruation, a day or two after the rupture, appears again and in about two-thirds of cases a decidua is discharged from uterus. Digital examination reveals uterus displaced in various ways, according to whether the outpouring of blood is in Douglas' cul-de-sac or anterior cul-de-sac or between the folds of broad ligaments. If the hemorrhage be large the blood may ascend up into the abdominal cavity, pushing the small intestines up, giving rise on percussion to tympanitic sound in upper part and dull sound in lower part of abdomen.

The prognosis depends upon many conditions. If the pregnancy

be discovered before rupture or abortion and the proper treatment instituted the outlook is favorable. If rupture has occurred and shock is not too great, the prognosis is also good.

The treatment is purely operative, whether in first months or in last months, whether before rupture or after rupture, provided shock is not too great. The method of operation, of course, depends upon the individual case. The entire sack with tube may be removed, or an incision through abdomen or vagina and turning out clot may be all that is necessary. If opened through abdomen, the walls of the sack should be stitched to the parietal pertoneum, if not already shut off by adhesions. When possible to open through vagina, that route is preferable.

The case I had some two months ago gave following history: Age thirty-two; white; married ten years; housewife; previous health good; mother of four children, the youngest being three years old; menstruated regularly until two months ago, since then cessation; for last month had been suffering with usual symptoms of pregnancy, nausea and vomiting being the most troublesome; patient considered herself about four or five weeks pregnant; while at breakfast table was suddenly siezed with excruciating pain in lower right abdomen, so severe that she could scarcely be gotten on bed. I was immediately summoned and on arriving about thirty minutes later I found patient in great pain with knees flexed upon thighs and thighs upon abdomen; incessant vomiting, almost no radial pulse, with a very feeble, rapid heart, cold extremities, appearance of great shock and temperature 97. A hurried digital examination was made and uterus was found enlarged up to pelvic brim and displaced towards the left, but no outpouring of fluid could be detected in pelvic or abdominal cavity. A diagnosis of ruptured tubal pregnancy or perforative appendicitis was made and the shock was considered due to pain and not to hemorrhage. A hypodermic of one-third grains morphia was given, hot applications to abdomen and extremities applied and six ounces normal salt solution as hot as could be borne was ordered by bowels. I left promising to return in two hours. Two hours later on my return,

patient was much easier, no vomiting and pulse slightly more perceptible. On examination still no hemorrhage could be detected, though a thorough examination could not be made on account of tenderness of entire abdomen, especially marked on right side in region of appendix and on account of general bad condition of patient. Hot normal salt solution was kept up every four hours by bowel, everything by mouth interdicted and morphine given from four to six hours hypodermically for forty-eight hours. Temperature ranged from 96 to normal and then began to rise gradually, reaching on seventh day 103.5. Pulse was almost imperceptible for forty-eight hours, then began to show improvement. On second day after rupture an ill defined tumor could be made out on the right side in region of appendix, which was gradually enlarging. Now, leaving out the history of patient, I had a typical case of perforative localizing appendicitis, and taking in history and leaving out of consideration appendicitis, I had a typical case of ruptured extra uterine pregnancy. As soon as patient's strength admitted and operation could be had, which was on the seventh day after first taken, it was performed. On opening up abdomen a large tumor was found, stitched to the abdomen wall and incised, when a lot of foul, dark clotted blood, one-half liter probably, escaped. All clots were turned out with finger and the product of conception was found loosely attached to right tube. The right tube had burst and the peritoneum had walled off the contents from the general cavity. The wound was irrigated with normal salt solution and drainage employed. Temperature dropped to normal in forty-eight hours, pulse began to improve and patient made an uninterrupted recovery.

DISCUSSION.

DR. J. F. Y. PAINE, Galveston: I have listened with much interest to the reading of Dr. McCelvey's paper, and congratulate him upon the satisfactory outcome of the case he reported. There are some points in his paper which I wish to discuss briefly.

First, the changes which occur in the tissues of the tube in tubal pregnancy. The tube thickens under the stimulus of the presence of the fertil-

ized ovum. This thickening is not due to hypertrophy of the muscular fibers, the connective tissue, the lymphatics and peritoneal covering, as occurs in the uterine walls in normal pregnancy, but to excessive vascularization, there being very slight increase in the tissue elements. With the progress of gestation the wall of the tube becomes stretched and thinned until it appears as a thin, almost transparent, membrane, composed of the attenuated muscle covered with its peritoneal investment. The fœtal membranes derived from the ovum are, with the exception of the placenta, the same as in intra-uterine pregnancy. Normally, the placenta is derived about equally from the decidua serotina of the uterus and the chorion frondosum of the ovum. In tubal pregnancy, the placenta is largely fœtal in its origin, being composed almost entirely of chorionic villi, the mucous membrane lining the tube being unfit to form a serotina.

The signs and symptoms of extra-uterine pregnancy are usually sufficiently well marked to lead to a diagnosis of that condition, if they are carefully investigated and faithfully interpreted. The history of an uncertain period of sterility, with the possible occurrence of pelvic inflammation during that time, the presence of the general and reflex phenomena of pregnancy, disordered menstruation, accompanied with gushes of blood, expulsion of the decidua, and coincident pelvic pain and tenderness, a pelvic tumor lateral to the uterus, progressively increasing in size, rarely fail to excite suspicion, and usually lead to a correct diagnosis after repeated examinations; yet there are typical cases in which the symptoms and signs are so slightly marked that the condition may be entirely overlooked until rupture of the gestation sac occurs.

The symptoms of rupture vary with individual cases. There is probably always overwhelming pain associated with the rupture, but the degree of anæmia varies with the situation of the placental attachment and the direction of the rupture. When situated at the floor of the tube, the rupture occurring into the abdominal cavity, the hemorrhage may be slight, while in cases of placental attachment at the upper border of the tube, rupture taking place in this region is usually followed by terrific loss of blood on account of the vascularity of the tissues. Again, rupture between the folds of the broad ligament is followed by modified anæmia, as the hemorrhage is limited by the laminæ of the broad ligament. In a certain proportion of cases in which rupture occurs into the broad ligament, although the patient feels the sharp pain accompanying the rupture, and is compelled to keep her bed for a few days, may not be aware of what has happened, attributing the pain to some trifling matter associated with her pregnancy, a harmless hæmatocele having occurred, and the patient finally makes a perfect recovery.

With regard to the treatment of these cases, if the pregnancy is in the

early weeks, the operation for the removal of the tubal gestation sac should be conducted on the same lines, and ought not to be more dangerous than a salpingo-oophorectomy for pyosalpinx or hydrosalpinx. The dangers of operation increase necessarily as the pregnancy advances.

When rupture occurs into the broad ligament, and the embryo is known to have perished, operative treatment is sometimes unnecessary, the case pursuing the ordinary course of a hæmatocele.

The point of evacuation of an extra-uterine gestation sac should depend upon its location. If it is situated low in the pelvis, and is of easy access through the vagina, unquestionably the best method of procedure is to evacuate the contents of the sac into that canal, and establish free drainage. This method is especially adapted to cases in which rupture has occurred several weeks or more before the surgeon has seen the case, in which there are elevation of temperature and local tenderness, evidence of incipient suppuration of the sac. In these cases the vaginal route is far less hazardous, and entails none of the dangers, while obviating many of the risks of the abdominal method, and at the same time yields a satisfactory result.

DR. T. P. WEAVER, De Leon: I want to commend Dr. McCelvey for his good management of this particular case. With all due respect to the doctor who has just gone before me, if I understood him aright, that all such cases should be operated on immediately. Is that correct?

DR. J. F. Y. PAINE: Yes.

DR. WEAVER, continuing: Right here is the point I want to make. It is all very well for the physician having the benefit of many years experience, but for the young doctors in particular, gentlemen, we should strive to be the guiding star of the community in which we live, with reference to caring for and preserving the life of those who may chance to fall in our hands. It is a mark of fine judgment to be able to individualize, for so often in our practice the life of the patient hinges on our judgment right at the particular time. No doubt, if you had said operate right now, notwithstanding the fact that older and perhaps more scientific men say do it now, your results would have fallen far short of what it was, in that you conserved the strength and tided her over the crisis or shock up to the point, that your operation was a success, in so much as you saved your patient. Judging from your statement, had you given that lady the very best possible operation at first call, why, undoubtedly, you would have had a funeral.

I want to commend the young gentleman for his exceedingly good management of his case. Not only in cases of tubal rupture, but in all cases of whatever kind, it behooves us to practice good common sense and judgment, as well as the fine-spun theory. I don't mean this for the old and experi-

enced, but for the reason that it might help some young doctor when the older doctors say operate right now.

DR. JOHN T. MOORE, Galveston: I would like to say a few words relative to the differential diagnosis between appendicitis and hemorrhage from the rupture of an extra-uterine pregnancy. There has been done recently quite a good deal of work on the blood conditions found in these cases. Much information can be gotten that will aid in making a differential diagnosis.

I have in mind a case that our colleagues at Galveston made a mistake in the diagnosis; the case was diagnosed appendicitis, but upon opening the abdomen was found to be filled with blood from the rupture of an extra-uterine pregnancy. In suppurative conditions there is, in most cases, a marked leucocytosis, with the iodine reaction positive. Cabot and Locke have shown the value of the iodine reaction in detecting a suppuration. It is found that in suppurative appendicitis there is marked leucocytosis, with the iodine reaction present; there is practically no alteration in the hæmoglobin or in the number of red cells in the blood. In cases of severe hemorrhages there is a marked fall in the number of red cells and in the hæmoglobin, while there is no leucocytosis, or, if any, only relative, and the iodine reaction is not present.

We need all the information we can get in the study of these cases in order to make a differential diagnosis. I feel that oftentimes the surgeon does not take advantage of some of the best means of diagnosis.

DR. J. M. FRAZIER, Belton: The question of diagnosis is the most important in that it concerns the general practitioner. Dr. McCelvey, in the case reported, was fortunately able to make at least an approximate diagnosis of either appendicitis or a rupture following a tubal pregnancy. In either case an operation was indicated, and the manaegment would be about the same.

I had a case last year, which I reported at the last meeting of the Central Texas Medical Association, of tubal pregnancy with rupture into the broad ligament and up to the time of rupture there was almost an entire absence of symptoms of pregnancy. Patient passed two weeks over her regular menstrual period, then had a profuse menorrhagia with shreds of decidua, and suspecting an incomplete abortion I did a curettement. This was followed by a few days cessation of the flow, which then returned, and with consultation a second curettement was done. The patient went on without developing nausea or any of the ordinary clinical symptoms of pregnancy, but a gradually developing tumor on left side of uterus forced me to suspect tubal pregnancy, especially as it was accompanied by an indefinite train of nervous symptoms with unusual prostration, and finally, about the beginning of the third month, such marked evidence of shock that an abdominal incision was made and a large hæmatoma with extensive peri-

toneal adhesions protruded. With irrigation and drainage, the patient made an uneventful recovery.

The point is, that in some of these cases a diagnosis without an exploratory operation is impossible. I am glad Dr. Moore has presented another possible way to make a diagnosis, and I hope it will prove of benefit, but I fear the general practitioner will not be able to avail himself of the suggestion.

DR. J. T. O'BARR, Ledbetter: Examination of the blood, as suggested by Dr. Moore, is all right if you have plenty of time. Many of these cases are not recognized until after rupture has taken place, and sometimes a very urgent and immediate operation is indicated, and in that case there is not time to wait and make a blood examination before operation.

DR. J. S. MCCELVEY, closed: In reference to the anatomical points as to the enlargement of tube, the doctor says you can not have enlargement of tube except that due to vascularity and not to hypertrophy. Now, gentlemen, I have never made a microscopical study of any specimen, but Runge, Obshausen and Fritch claim that there is a real hypertrophy of both the muscular tissue and mucous membrane, just as occurs in uterus in normal pregnancy. The muscular fibers of the tube increase and enlarge and the mucous membrane grows and envelops the ovum and the decidua serotina, vera and reflexa are formed. In regard to symptoms, if rupture occurs between the folds of the broad ligament, and there is but little outpouring of blood, the symptoms are very slight and patient recovers without any treatment whatever. But in this case of mine the rupture was into the general peritoneal cavity, and while there was not much hemorrhage, there was great pain, which pain caused severe shock. When the rupture occurs into the general peritoneal cavity there is nearly always shock, hemorrhage or no hemorrhage, and that shock is due to pain just as occurs in perforation or ulcer of the bowels. The patient may die from the latter in a few hours, though there be no hemorrhage and it is too early for sepsis.

Some one thought the patient should have been operated on immediately, which I think would have been a fatal mistake. The patient suffered from such marked shock for forty-eight hours that an operation was out of question altogether. As soon as reaction was brought about, which was several days, an operation was advised, but not consented to for several days more.

SECTION ON MEDICAL JURISPRUDENCE.

REPORT OF CHAIRMAN.

J. R. NICHOLS, M. D.,
TERRELL, TEXAS,
First Assistant Physician, North Texas Hospital for the Insane.

"Medical Jurisprudence is a branch of jurisprudence that pertains to questions concerning wounds, poisons, insanity, and presumption of survivorship, requiring technical knowledge of the medical science for their elucidation and determination." It is not my purpose to deal with the subject in its entirety, but will confine myself to that part pertaining to insanity; describing the methods of provision, management and treatment of mental diseases now adopted in this country.

It is necessary to refer to ancient methods in order to contrast the progress that has been made in this branch of science.

Past history of psychiatry up to the middle ages is known as the era of demoniacal exorcism. From this period up to and including the eighteeenth century is known as the chain and dungeon era, then follows the special asylums and hospitals, which continue to the present time with gradations of improvement to meet the existing conditions of scientific advancement.

All alienists agree that the earlier insanity is recognized and given the proper treatment, the more favorable is the prognosis, therefore the most modern method is the establishment of psychopathic hospitals for immediate provision and treatment, obviating the delay incidental to admitting the patient to the eleemosynary institutions for the insane.

This method is of prime importance to the patient and a source of comfort to those immediately interested, besides it would not be

necessary to provide custodial care in prisons, a custom which needs only to be mentioned to be condemned.

After a certain period of time, the stationary and unimproved cases in these psychopathic hospitals are adjudged of unsound mind and committed to the regular hospitals for the insane.

Germany is taking front rank in constructing these institutions, having them in all the large cities; they are managed and equipped similarly to our general charity hospitals.

Alienists and students of mental diseases substitute the terms "hospitals" and "mentally diseased" for "lunatic asylums" and "crazy." These latter designations are harsh and frequently produce a deleterious moral effect on the sensitive patient. The laity are uneducated to the fact that insanity is not a disgrace, and so long as they persist in stigmatizing the mentally afflicted, so will the restorations be diminished. The frequent recurrence of mental disease is largely due to the want of confidence that the restored patient encounters, which humiliation revives the exciting cause.

At the close of the nineteenth century we have special institutions for the insane, epileptic, criminal insane, inebriates and mental defectives such as idiots, imbeciles and feeble minded.

The methods of provision have undergone a decided change and the block of concrete system of buildings is being superseded by the cottage plan, which is a more home like environment for the patient, whereas the block system is too sudden a departure from domestic life to be conducive to real comfort and happiness.

All observers agree that more good is accomplished by moral agencies in the treatment of mental diseases than by medicinal agents, therefore the patient should be placed in the most suitable environment; home like, sociable, with orderly and friendly associates. The psychical impression made upon an individual in a confused mental state is quite a factor in the ultimate prognosis and no expense should be spared in constructing our State hospitals with all the modern appointments. I heartily endorse the cottage system as the most feasible plan of provision for the mentally diseased; it offers many advantages over the block system:

First, is classification which insures happiness and contentment, a condition which aids materially the prognosis.

Second, an ideal hygienic system is secured.

Third, isolation of infectious and communicable diseases.

Fourth, danger of fire is very much reduced and the entire institution is not exposed, a condition that is a source of much anxiety in the block system, where hundreds of patients are housed under one roof; and

Fifth, the cost of construction, maintenance and repairs is not any more than that of the block system.

The physical management of our hospitals for the insane and the scientific treatment of mentally diseased and mental defectives have made wonderful progress in the United States, surpassing similar institutions in Europe, but there is a deficiency in original research from a pathological standpoint which is made a special department of study in the foreign hospitals, whereas only a small number of our institutions have well equipped pathological laboratories; however, this department is recognized as an important adjunct and it is only a question of time when the others will fall in line.

Many of ous State hospitals have a well organized staff of physicians and surgeons who are enthusiastic in this branch of science, not so much for the remuneration they receive as from patriotic and charitable feelings toward their fellow man.

The moral influence that encouraging words, patience and diplomacy exerts, is of the greatest importance in the treatment, and it can only be acquired by long experience and special study of each case. Another commendable feature is regular staff meetings, the object and purpose being to present papers and cases which are discussed; there is no question that such meetings act as a stimulus and each member of the staff will naturally put forth his best efforts.

I will briefly outline what constitutes the accepted methods in this country for the public care and treatment of mental diseases from an eleemosynary basis. The location of an institution of this

kind is of special importance to the public and State; a site should be selected near the center of a given population, easily accessible from all directions by adequate railroad facilities; there should be at least one tillable acre of land to each patient, and the capacity of the institution should not exceed twelve hundred beds.

The surroundings should be hygienic, a natural drainage, uncontaminated atmosphere, and an inexhaustible supply of pure water. An abundance of native shade trees adjacent to the building site will save expense and provide shade for the patients, visitors and employes. A gravel pit on the premises will insure good walks and roads at a minimum cost.

The institution should be constructed on the cottage plan with all the modern appointments and entrusted to the management of a wide awake, energetic superintendent endowed with recognized executive ability and scientific knowledge; he should surround himself with enthusiastic, educated and conscientious medical assistants, loyal in every respect, and select competent heads for the other departments.

A pathological laboratory should be established, original research encouraged and regular staff meetings held at stated intervals, where papers and questions beneficial to the institution should be discussed.

There should be a well equipped operating room, constructed and arranged similar to those in our general charity hospitals, where aseptic surgery can be done according to modern methods. Electro and hydrotherapeutic apparatus should be installed as important adjuncts to the hospital equipment.

Trained attendants are much superior in every way to the inexperienced, therefore training schools should be established with a two years course for graduation, the didactic and clinical lectures to be delivered by the hospital staff, assisted by experienced graduated tutors who should instruct in the practical duties on the ward and at the bedside.

Diversion is an important adjunct in producing contentment and mental rest, as idleness breeds discord. Patients are encour-

aged to take exercise, as daily recreation in the park, and assist with the work in the different departments of the institution, but no drastic measures are permitted to coerce them; the general experience of observers both in this country and in Europe is, that properly selected employment for each patient is of great value in the treatment and this systematic employment is profitable to the institution.

All of those who are physically able and understand in a measure the import of the duties assigned are permitted to employ themselves. They assist in the general housekeeping of the ward, and many of the females become quite proficient in mending, knitting, hemstitching, crochet and drawn work.

The different departments have their regular quota of patients, as the laundry, sewing room, kitchen, barns, mattress shop, farm, grounds, store room, plastering, painting, plumbing, dairy, garden, tailoring, dining room, and emergencies that come up from time to time. Precaution is taken at all times to prevent over exertion on the part of anyone.

The average amount of labor done by a patient is estimated as being about one-fourth of that of a sane person under the same conditions and circumstances.

Various amusements receive special attention and many of our State hospitals have a well organized orchestra to furnish music, which Abbott says is the only "perfect language of the higher emotions."

Games, both indoor and outdoor, as cards, billiards, pool, dominoes, checkers, chess, lawn tennis, baseball, football and other field sports have their place in the treatment of mental diseases.

Literature is provided, as books, periodicals and newspapers, which furnish a mental stimulus and is the means of whiling away the time and the lonesome feeling that idleness courts. Also the regular dances, which permit the males and females to mingle with each other and is a source of especial enjoyment to them. Other diversions, as band concerts, matinees, concerts, carriage drives, picnicking, fishing parties, gymnasium, bowling alleys and swim-

ming pools, are recognized as important adjuncts to an up-to-date institution. These methods of diversion aid in producing new fields of thought and stimulate a cheerful feeling, besides it goes without contradiction that a depressed mental state naturally exists in any individual who is deprived of his freedom, which is the fundamental principle of this glorious government.

A system of open wards where patients are allowed the privilege of going out and coming in at pleasure, within certain prescribed hours, has proven to be quite a success; it restores the confidence of the patient and cultivates self-reliance. Certain rules are prescribed as to boundary limitations and conduct. It requires clear forethought and judgment in perfecting a classification for this system and can only be available by those who understand what constitutes honor and integrity.

A most important feature of this plan is the abolition of restraints, which permits a more natural condition and removes the continuous exciting influences that close confinement and seclusion engender.

It is the present policy in many institutions to discountenance any mechanical restraint, as padded rooms, chains, muffs, wristlets, lock-beds and lock-chairs. It has been ascertained that the most violent, restless and destructive patient can be controlled without these methods; however, chemical restraints assist in a measure, but they have been reduced to a minimum.

The locking of patients in rooms and dormitories at night is becoming obsolete, but is necessary in some cases. This open door policy aids materially in improving the hygienic conditions and reduces the danger of accident.

The employment of an increased number of night attendants is necessary, but the expense incurred is of secondary importance when the health and comfort of the patient is under consideration.

The construction of open pavilions on the grounds, isolated from the public drives and walks, is a feature that redounds to the credit of any hospital, especially when an abundance of shade trees are conspicuous by their absence. Its architecture should be rustic in

design and equipped with comfortable seats, patent swings and hammocks, free latitude being permitted for social enjoyment and amusement.

Admission of visitors to the grounds, various departments and special wards is a prevalent custom in many State hospitals. I regret to say that the existing ideas of restraint and raving maniacs as the phenomena to be observed, continues to cling to the public and many turn away with disappointment, because they were not allowed to see the worst cases, where dungeons, chains, padded rooms and other contrivances existed. Such ideas show lack of education on the part of our citizenship and they do not understand that these methods have about disappeared under modern provision, care and treatment.

The plan for adjudging patients requires a regular legal process but the jury trials and other procedures that are necessary for criminals are becoming obsolete, in determining the mental soundness of an individual. It is only those who come in daily contact with these patients that can appreciate the mental anxiety that such methods excite and practical experience has demonstrated that deleterious results follow such practice, both from a moral and physical standpoint. You frequently hear them plead that they were innocent of the charge and that no infraction of the criminal statutes was committed, but the usual confinement in jail makes an indelible impression, which requires patience and reason to eliminate. This particularly applies to those cases that have a degree of intelligence and possess delusions of persecution.

The most approved method for adjudging a person of unsound mind is outside of the temple of justice, except in contested cases. No publicity should be countenanced and in preparing the necessary court papers, care should be exercised that unbiased evidence of two or more members of the medical profession should be secured as well as any other evidence, under oath, to prove conclusively that such a person is of unsound mind.

Approved blank forms, as recommended by the State hospitals, should be filled out with care, so that a complete history of

the case can be ascertained. It is important to have the family and personal history, as also the facts pertaining to the immediate attack. Correct data aid in making up the statistical tables for the annual report and furnishes compact knowledge from which deductions and conclusions can be made.

It should be the policy of all our States to make ample provision for the insane, so that trained attendants can be dispatched to immediately and safely conduct the individual to the State hospital.

Public opinion will ultimately demand that such cases should not be incarcerated in prison, even for a short period of time. Mental unsoundness is a disease of the brain, either due to direct or remote functional derangement of the nervous system, which may be transient or organic in character, resulting from heredity or stress, therefore ample provision, care and best methods of treatment is a duty that the public owes to its unfortunate fellow man. It devolves upon the twentieth century to correct these inhuman customs, which can only be done by education.

The evil effect produced by an aggregation of the different types of mental diseases clearly demonstrates the wisdom of segregation. It is necessary for many of the State hospitals to provide custodial care and treatment for idiots, imbeciles, feeble minded, inebriates and epileptics, which bring together a heterogeneous condition, which is not conducive to the improvement of each class.

It is practically impossible to manage scientifically an institution of this kind. State provision for each class is the solution of the problem, and special institutions should be constructed with all the modern appointments, where the number of cases will justify the expense. Texas is now building the State Epileptic Colony at Abilene, which will eventually remove the epileptics from hospitals for the insane. The time is coming when another eleemosynary institution will be constructed for the care, education (both industrial and literary) and treatment of those mental defectives termed idiots, imbeciles and feeble-minded. The purpose will be to admit children within certain prescribed ages and remove them from the

hospitals for the insane. It has been clearly shown by similar institutions in other States and countries that a certain per cent can be educated and so mentally improved as to make useful citizens, besides the general improvement in the majority of cases.

Public provision for inebriates is another approved plan, but little progress has been made in this country, separate institutions being provided for those types of mental diseases resulting from alcoholism, both acute and chronic. It requires no forethought to see what a benefit it will be to the citizenship and posterity of any State. Numbers of these cases can be cured in a very short time, if no permanent pathological change has taken place in the cerebral tissue or vital organs.

In all eleemosynary institutions there are cases of pulmonary tuberculosis and special cottages should be erected, with complete equipment—a perfect sanitary condition is all important—with good ventilation and solariums. The most approved method of treatment should be given in all its details.

There is another class known as the criminally insane, which requires observation and judgment to form an opinion in those cases of suspected simulation. The association of this class with the other patients in our State hospitals exerts a detrimental influence upon the sensitive and appreciative person, also on those that have delusions of persecution. Insane criminals, according to their nature, require entirely different disciplinary treatment from the ordinary insane. It is best to segregate such cases in isolated annexes or establish a branch department at the most centrally located institution, the object and purpose of said department being to admit persons, where the plea of insanity is a defense for a violation of the criminal statutes, and those that become mentally unsound after conviction or before term of punishment expires. The suspected cases of simulation should be closely observed at all times and the importance of a trained corps of attendants will materially aid in detecting the malingerer. The system of provision, care and treatment will necessarily be more drastic than that for the mentally diseased.

The most approved method for the criminal class is separate institutions, but this is not economical unless the number of cases justifies the expense.

It is difficult to realize the number of eleemosynary and penal institutions in all countries, and their number is gradually increasing. There is a limit to all things, and it is only a question of time when the philanthropists and taxpayers will see the necessity of restrictive laws as the only solution to the hereditary transmission of disease. The statutes should be so drastic as to stop all procreation of species, and if enforced in all its details, will in a degree improve the society and health of our citizenship, as is forcibly illustrated in the animal kingdom.

Education of the masses is a means to this end of solving this momentous problem, but so long as personal liberty is engrafted in our souls, so will the hereditary transmission of disease continue, notwithstanding the protests of our profession and students of psychiatry.

In conclusion, I can not refrain from trying to impress the necessity of education along this line in regard to our legislative bodies. It is a physical impossibility for the management of the State hospitals for the insane and mental defectives to incorporate modern principles with inadequate appropriations.

Economy and honesty are a necessity in all State governments, but the public service frequently retrogrades because cheapness is considered economy. It is not right to place the dollar before our unfortunate fellow man, and liberal means should be provided, from time to time as necessity demands, for the proper care and treatment of mental diseases. Legislators know that the people desire an economical and honest administration of the State government and their consciences dictate the necessity of guarding their interests, but in doing so they do not represent the friends and relatives of the indigent patients who demand and expect of the management of these institutions everything imaginable for their proper treatment, which brings us face to face with the saying, "If you are going to do anything, do it well."

How can a progressive superintendent follow the dictates of his conscience when he so carefully prepares an annual budget to meet the demands of the people and keep abreast of the times, then have it trimmed down by the inexperienced, so that the expense of the government should not exceed the revenue, thereby forcing an imperative necessity for the public service of many State hospitals to be deprived of means that are so necessary to its proper management in all of its details. Banquo's ghost arises and frightens those who have future political aspirations, if they conceive the idea of providing more revenue. Self-preservation, the spirit of politics, pervades his innermost soul.

CEREBRAL PALSY OF CHILDHOOD.

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Perhaps the spinal paralysis occurring in childhood and known as acute anterior polio-myelitis and producing paralysis of one or both lower limbs, has attracted more attention on the part of the general practitioner than those paralyses of cerebral origin. This is due to the more definite course, the shorter duration, the more exact clinical history and the want of psychical symptoms, which leaves the disease almost entirely in the hands of the general practitioner, while the cerebral cases sooner or later find their way to the specialist and usually to the public institutions.

The cerebral paralysis of childhood, however, is not so restricted either in pathology or symptomatology as those of spinal origin, and it is frequently marked by convulsive seizures and these are often considered purely epileptic.

When the disease occurs in the newly born it is not infrequently unrecognized for several months. It need scarcely be added that every disease producing such mental obliteration and such unhappy physical effects as cerebral palsy should be familiar to all practitioners.

According to Sachs, our very best authority on this subject, the disease has three periods of development, viz.: First. Pre-natal, that is, any time before the birth of the child. Second. Natal, or at any time during the prolonged and difficult passage of the child's head through a narrow pelvis, where great compression, unequally distributed, is brought to bear upon the soft, bony and cerebral tissues, not infrequently resulting in a large meningeal hemorrhage. Third. Post-natal, which means any time after the birth of the child, but is usually within the first decade of its life.

The fact that nearly all of these cases develop convulsions sooner

or later in their history, at first unilateral, but later general, and partaking of the character of genuine epilepsy, makes the accurate observation and early treatment of this trouble of great importance.

The clinical history, especially in the early states, is frequently obscure and may be entirely overlooked, or, if the symptoms are pronounced, it may be considered a totally different disease. Sometimes the child is taken with fever, followed by delirium, and in some cases stupor and vomiting also occur. Aphasia and convulsions may likewise mark the initial stage of severe cases. Within a short time the following unfortunate features present themselves and are characteristic of the trouble.

First, paralysis; second, contracture of muscles; third, spasticity; fourth, idiocy, imbecility or insanity, according to the time of its development and the character of the cerebral irritation or destruction; fifth, convulsions, sometimes on one side, involving an entire lateral half of the body and later becoming general. The motor agitation may possibly be confined to one extremity. The paralysis usually manifests itself in the form of hemiplegia more or less complete, which is said to be the usual form in post-natal cases. Next in frequency occurs paraplegia, due to pre-natal conditions, and third, diplegia, or the simultaneous paralysis of each lateral half of the body. In other words, a double hemiplegia. Some authors include a monoplegia, affecting but one extremity, but this is said to be rare.

The hemiplegia may be complete or partial, involving the complete loss of motion of an entire side, including the face, though it is more usual for the face to escape serious involvement. The tongue is sometimes involved, but not seriously and not constantly.

Some of our writers have asserted that babies have been born not only with the paralysis, but with the contracture of the limbs, which had occurred in utero.

My own personal experience has enabled me to observe only the hemiplegic forms of this disorder, and the experience is largely confined to hemiplegia, of which we now have under observation

a number of cases. If the hemiplegia occurs at birth from pressure by the natural channel, or the improper application of forceps, the paralysis may not be detected for some months, until the child's growing of the other side of the body makes it noticeable. The arm and hand are the greatest sufferers from the paralytic and contractural influences. The leg and foot usually recover much of their usefulness by persistent practice, but the arm usually remains flexed at the elbow, deeply flexed at the wrist, with the fingers either stiffly extended or flexed in irregular position and the entire arm adducted and folded upon the chest.

The deep reflexes upon the paralyzed side are more or less exaggerated. Sometimes so keenly sensitive that ankle clonus is easily produced. The reflexes upon the sound side are not disturbed. There is no paralysis of sensation on the paralyzed side and no difficulty with the sphincters. The arm may become useless and the leg may be so shortened and so stiff that locomotion is seriously impaired.

Athetoid and choreic movements frequently occur in the paralyzed extremities. Asymmetry of the face and different sides of the body occurs from the failure of development of the muscles from disuse, but there is no trophic atrophy. The body may be well nourished and the patient do well in all other respects. Such children, however, are apt to be irritable, morose, unstable, dull, inattentive to their school duties, unteachable, capricious and willful.

The most important symptom is the motor disturbance or convulsions, when the lesions are distinctly localized in the superior motor centers. It may manifest itself in convulsive twitchings at irregular intervals, of a hand or foot, or even a smaller segment of the motor circle. Indeed, it may appear to be a true Jacksonian epilepsy.

If the lesion is large enough or sufficiently distributed to affect the entire motor zone of one side of the body the convulsions may occur at first and for years upon that side, but in nearly all cases with the progress of the disease the convulsions become bilateral and general and the patient is afflicted with genuine epilepsy.

PATHOLOGY.

The pathological findings of this disorder, while diverse in different cases, are fairly frequent in the aggregate. They consist of, first, cerebral hemorrhages; second, cerebral cysts; third, cerebral sclerosis; fourth, cerebral atrophy; fifth, meningo encephalitis according to Strumpell; sixth, focal softening, according to Oppenheim; seventh, porencephaly or defective formation of the brain; eighth, hydrocephalus, and ninth, according to Sachs, a well defined agenesis of the cortex, or a failure of cortical development. These lesions are usually found upon the surface of the brain but some have been known to develop in the basal ganglia. Their location and extent determine the character of the motor disturbance and paralysis. It has been definitely stated that large effusions of blood have been found over the cerebral cortex in newly born infants, due to the prolonged pressure and blood stasis and tearing of the sinus veins. If the patient survives, this clot will be more or less organized into a dense membrane and the original character of the lesion overlooked.

The most important effect of this pathological condition is upon the development of the mental faculties. Such children are either idiots, imbeciles or dements.

ETIOLOGY.

In addition to prolonged confinement and personal shocks to the pregnant mother, infectious diseases of childhood, measles, scarlet fever, diphtheria, pneumonia, smallpox and typhoid fever have been strong factors. Injuries to the child after birth are also causative. Syphilitic infection or heredity plays some part. Oppenheim considers premature birth an important factor. Acute inflammation of the brain and its membranes from infections are causative, and likewise embolism and thrombosis of cerebral blood vessels from the same causes are important.

It is claimed that the improper use of forceps has also a positive causative effect, but on the contrary it is believed that the proper

application of the forceps in tedious and difficult labor will have a preventive effect.

DIAGNOSIS.

Most of these patients present more or less definite clinical features, and the disease can not be overlooked by a cautious observer, but it may be masked by convulsions and consequently be pronounced epilepsy upon this superficial study, and continue under that classification. It should be said in this connection that cerebral bony anomalies and asymmetry form suspicious circumstances.

Markedly microcephalic or plagiocephalic skulls have an indicative bearing. The definite presence of paralysis, with the rigid condition of the muscles and increased tendon reflexes with convulsions, makes the diagnosis almost certain. The convulsions, as before stated, may be limited to one side and there is no involvement of sensation, and the ultimate fixation of the limb in contracted position makes it certain. It must be differentiated from epilepsy, and from acute spinal paraylsis, which affects one or both extremities and is degenerative in character with lost reflexes and occurring suddenly with high fever, vomiting, stupor, and immediately following paralysis. There are no later convulsions and no cerebral symptoms in the latter disease.

TREATMENT.

After they have reached our asylums, little remains to be done except to take care of the general health and treat any symptoms arising. Prior to this time, it may be surgical, to remove an early lesion of definite location and certain effect. Medical, to build up the child, prevent the development of convulsions, save him from the stress and strain of life, and above all not to attempt to educate him as a normal child. Preventive treatment is rarely considered, and yet, when it is remembered that so many of these cases are due to dystocia, according to Joseph Collins, it is incumbent upon every obstetrician to use every scientific means to lessen prolonged and dangerous deliveries. The forceps should be used before pressure has been productive of the lesion. After birth peo-

ple should be thoroughly educated to avoid all the infections of childhood instead of courting them, as seems to be done even yet among the less educated classes. It should also be stated that every infectious or contagious disease should be treated with more care and foresight, to prevent complications.

In the acute form of the disease, rest in bed, ice bag at the head, free purgation, light diet and bromides to produce quiet. Later, if convulsions appear and a definite lesion can be found, remove it. If not, treat expectantly. For wasting or undeveloped muscles use friction, warm baths and massage. If contracture is very great the tendons should be cut, and such orthopœdic appliances used as will effect the highest degree of locomotion. After genuine epilepsy has developed, nothing is effective.

In conclusion, I desire to present to you the following illustrative cases:

First. *Post-Natal, Left Hemiplegia.*—W. E., aged twenty years, parents healthy, father railroad man. Heredity good except one paternal uncle epileptic. In childhood had measles, mumps and whooping cough. There was no difficulty at the time of his birth. His mother was in labor six hours and was normally delivered. She had not had any fall, injury, shock or fright of serious character, and neither had the child up to the development of an attack of illness which produced the present condition. At eight years of age he had a severe attack of typhoid fever, which lasted six weeks. At the end of the third or beginning of the fourth week he became unconscious suddenly and developed paralysis, involving the entire left side. He could not move either arm or leg, but after his recovery from unconsciousness he could feel on that side, though sensation was weak. He had fever at the time the paralysis occurred, but was not delirious. It was thought he would die, but slowly he emerged from the difficulty. Within two or three months after the paralysis occurred the hand and leg of the affected side began to draw up. Up to this time he had never had any fits or convulsions, and had manifested no weakness of mind. His recovery from the typhoid fever was slow and he remained dull afterwards, fre-

quently with pains in his head, which would last for twelve hours, and occur once or twice per week, when he would have no appetite, become irritable and depressed. He continued in this condition until three or four years ago, when he began to show slight evidences of mental disturbance; he became irritable, morose, unruly, with capricious appetite, irregular bowels, headache and unusual conduct, such as crawling under the bed upon getting miffed at any little thing. This condition gradually increased until it became necessary to admit him into the institution January 13, 1902. He had not up to this time and has not since, so far as we know, developed any convulsions. He was placed upon systemic treatment, kept quiet, dieted, regulated, given a tonic with an occasional sedative, and has continuously improved in physical condition, and his mental irritability appears now to be as well as it can ever be expected to become. Upon inspection at present it is seen that his head is not entirely symmetrical, but not markedly otherwise. Vision is apparently normal. Slight pterygium on each eye, hearing normal, rather high arched palate and a few bad teeth, but nothing special. Eye and tongue movement normal. Slight asymmetry of chin and left side of face. He presents a very marked case of left hemiplegia with contracture of the muscles. There is very little difference in size in the muscular development of the two sides, from three-eighths to three-fourths of an inch. He has slight athetoid movements in the left hand. The flexors of his hand and arm are considerably contractured, as also those of the leg, interfering seriously with his gait, producing a pes-equinus. The patellar reflex upon the afflicted side is much exaggerated, the other side is normal. Sensation in paralyzed side is normal. The superficial reflexes are also normal. The electrical response to a secondary Faradic current is quite normal upon the entire left side. He is therefore a typical case of cerebral palsy, occurring at the age of eight years and following an attack of typhoid fever, probably directly produced by a cerebral hemorrhage over the right motor cortex. He illustrates the classic features with the single exception of convulsions, which he has never yet developed, but which

may occur in the course of the disease. He has the typical paralysis, spasticity and contracture of the muscles with normal electrical response and with the mental enfeeblement characteristic of the disease.

Second. *Natal, Right Hemiplegia.*—E. R., age nineteen years. Father healthy, mother subject to nervous headache and indigestion. Maternal uncle suffered for years with nervous disease, at times unbalancing his mind temporarily. His maternal great aunt during childhood was subject to blind flashes, eventually going blind and dying at the age of eighteen.

His mother did not have any fall, injury, shock or disease prior to his birth that would affect him. At birth no instruments were used, though it seems they were contemplated and kept in readiness, for the labor was very long and extremely difficult, and the mother had severe convulsions before his birth, and medicine had to be administered for that purpose.

Immediately after birth it was noticed that he fretted and cried all the time, practically till three months of age. After birth, so far as known, he never had any severe shock, injury or fright, and none of the ordinary diseases of childhood have been reported. The first thing wrong observed about the child, as before stated, was his continual fretting and crying till about three months of age, when it was observed that he was paralyzed upon the right side, and that he took everything in his left hand, keeping his right hand closed. Later, when he attempted to crawl and walk, he did not seem to have good use of his right leg and foot.

His mental condition did not show any deviation from that of a growing child up till twenty months of age, when he began to have convulsions. They were light at first, and occurred upon the left side, as the history shows he was drawn to that side. This is presumably due to the paralytic condition of the right side. In about one year he had another short period of convulsions, and then they came at intervals of several months, and then they became of almost daily occurrence. He had the usual epileptic symptoms, but remained a comparatively bright child until seven or eight years of

age. He was sent to school for a short time, and learned quite well, but was forced to leave school on account of the hard convulsions. These convulsions continued, becoming more frequent, and his mental condition constantly deteriorating until he finally became turbulent and unruly, suffering from severe convulsions, attacking people about him, his speech becoming more and more difficult, and his memory rapidly failing, until it became necessary to admit him to the institution three years ago. Since which time, he has progressively become demented, and his convulsions have continued.

He has just recovered from an attack of pneumonia followed by a suppurative otitis media in his left ear, which is still quite bad. A slight inspection shows that his head is large enough, but asymmetrical. He is paralyzed upon the right side, and has suffered from failure of muscular development along the entire right side. Measurements around the right biceps on left side show 8¾ inches, right side 7 inches. Left wrist 6 inches, right wrist 5 inches. Around middle of left thigh 14¾ inches, right thigh 12¾ inches. Left calf 11⅜ inches, right calf 10 inches. Patellar reflexes on both sides are exaggerated, but markedly so on the paralyzed side. Sensation is normal on the paralyzed side, and his sphincters are under control. His superficial reflexes are not quite sensitive, but I think this is perhaps due to his demented condition. His right hand is flexed at the wrist; fingers usually contracted, but no marked contracture, as they can be extended.

From the history of this case and his present appearance, I think we are safe in concluding that this is a natal case of cerebral palsy, occurring at birth, from the long continued pressure upon the child's head. Paralysis first occurred, and it was nearly two years before convulsions supervened. He has pursued a perfectly typical course, and has been all the time beyond the hope of medicine and surgery. His mind is almost extinct, and it is only a question of a short time, with his greatly reduced vitality, till an epileptic convulsion will terminate his life.

DISCUSSION.

DR. J. F. Y. PAINE, Galveston: I have nothing to say in the way of discussion of this paper. It is so complete and the histories of the cases reported so clear and comprehensive; in fact, it is such a full presentment of facts, there is scarcely anything left to say on the subject. I only desire to thank Dr. Graves for presenting these interesting cases to the Association.

DR. E. W. LINK, Palestine: I want to know if these are not the cases surgeons used to operate on by opening the skull in order to give the brain room to grow; they claimed that the sutures united too early and that the brain was held in a vise.

DR. E. E. GUINN, Jacksonville, said: What per cent of your inmates are epileptics?

DR. M. L. GRAVES, said, in closing: I have very little to say in conclusion. In answer to the doctor as to the percentage of epileptics, we have a population of 700 in the Southwestern Insane Asylum and 125 to 150 are epileptics, and I presume the other institutions have a similar proportion. Dr. Worsham can answer for Austin and Dr. Nichols for Terrell. Certainly we have more than enough to fill Dr. Preston's institution, and we can swamp him the first day that the train will take them.

DEGENERATIVE STIGMATA.

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SAN ANTONIO, TEXAS.

To the physician who is constantly and actively engaged in a general practice the title of this paper may carry with it the idea of a subject remotely affecting his greatest professional opportunities. Such an idea would be far from correct. It affects, not only the present, but future generations, wherein prophylaxis—the true physician's greatest opportunities, highest aims and noblest ambitions—may be practiced on the highest and broadest planes and with assurance of results conducive to the highest good of the race.

The subject is so extensive that a consideration in detail here would become long, tiresome and uninteresting, thereby defeating its purpose, which is to freshen and fix in our minds those signs of organic weakness constantly observable in the ordinary walks of professional experience and observation, and to enable us to interpret their significance and to divert the tendencies of which they are the indices.

By degenerative stigmata is meant the visible signs of vices and of transmitted hereditary weaknesses. They constitute the indices of the accumulations of instability of organization and are directly inherited, or acquired by reason of hereditary developmental or metabolic deficiencies, and they mark a tendency which, if allowed to duplicate itself for a few generations, and if not fortified and checked by intervening hereditary influences of opposite tendencies and by corrective developmental and environmental influences, will finally result in annihilation of its stock through imbecility, sterility, idiocy and early decay. It would be impossible to describe every degenerative stigmata possible to mankind, for, as every individual differs from every other individual, so may his peculiarities and defects likewise differ.

It is to be remembered that the degeneracy is always a mark of positive and fixed identity in nature, significance and origin, however varied may be its stigmata. In every case an hereditary predisposition would be found if we had the means at hand to discover it. The trouble lies:

First. In the difficulty in obtaining correct history. This difficulty is due partly to a reluctance on the part of their relatives to admit of a weak streak in them, rather preferring to assign the cause of the defect to some accident of childhood or to maternal impressions, etc. The other difficulty is due to ignorance. They can assign an hereditary influence if the exact similarity of defect was plainly manifested in the parent. For instance, if the epileptic child's parent had epilepsy, or if the idiotic or insane child's parent had been violently insane, but if uncle or aunt or cousin or grand parent were similarly affected it would not appeal to them, or if the epileptic or insane or deaf-mute or deformed child's parent or grand parent were a periodic drunkard or had neurasthenia or hysteria, an hereditary family history would hardly be obtainable, they not knowing that degenerative stigmata have no law of similarity of transmitted manifestations; that a bad organization is responsible for them all; that often an individual or degenerative parentage may exhibit no stigmata at all, and that the potentiality is kenetically stored up in his organization only awaiting to unite with its affinity in the formation of some future being, when the potentialities will become active and possibly accentuated. It is probably enough here to say that these stigmata vary from gross anatomical deformities through a long chain of variations and degrees up to slight eccentricities of character. With a view to greater convenience and simplicity they have been variously classified by different authors as teratological and functional, as anatomical, physiological and psychical, etc. For the sake of brevity, we may say, first, that there are many bodily deformities and discrepancies which we may always recognize as degenerative in significance, and that they comprise all deformities and asymmetries of the cranium, face and trunk, with possibilities of similar defects

of their appendages, except in a few cases where caused by traumatism in utero or infancy.

Second. That there are many more degenerative stigmata just as often and as easily observable, and just as significant, which are exhibited otherwise than in bodily deformities, and of these may be mentioned the various neuroses (sometimes called the insane hereditary equivalents), neurasthenia, hysteria, epilepsy, chorea, dypsomania, migraine, etc., and that there are equally as significant physiological disturbances, such as stuttering, stammering, strabismus, convulsive tics, etc., and that some children are backward in teething, walking, talking and learning (some presenting the opposite manifestation, marked precocity), and that some have convulsions from trivial causes, night terrors, mad fits, as well as laughing spells in which they lose their breath and become cyanosed temporarily. These all mean nervous instability. Then, with equal importance to any form of stigmata, are paranoia, imperative concepts and impulsive and compulsive acts. The members of this class commit the greatest crimes and consequently play an important role in criminology. These are simply developmental defects, deep grounded, and as incurable as idiocy, to which they are similar in origin and kind, the difference being only in degree. Often neither they nor the public are able to recognize their deficiencies, and they are the last to crave sympathy or to demand justice. That they do not ask for it does not mean that they should not have it, and it devolves upon the medical profession to give it to them. True, medical science is facts and leaves to society the disposition of its disharmonies, but the medical profession is a part, and should be an important part, of society, and is entitled to help frame its standards. These delinquents are products of society, and society should not disown them nor disclaim its responsibility for their welfare.

The three cases here presented are with a view to observe some of these degenerative stigmata.

This young man, E. R., is twenty-three years of age, an American; single; was raised on the farm; has no education. His relatives

are dead, and there is no personal or family history obtainable. He is an epileptic imbecile. The epilepsy has existed for several years. Just how long can not be learned. His physical health is good, and his reactions and sensations are normal. He presents many degenerative stigma. His cranium is quite asymmetrical, presenting what is called the plagio-cephalic head, or that of oblique shape. It is also too low (cemo-cephalic), bin-auricular arc measuring 31½ c. m., the average normal head in this measurement being 32 c. m. The naso-occipital arc is 33 c. m., a little above the average, which is 32. The circumference is 53½, the normal being 52. The position of right ear is a little higher than the left, and lies more closely to the head. He has a narrow and arched palate.

The second case, L. J., is thirteen years of age; an American. She is an epileptic idiot. Her family history is meager and imperfect. The only relative known to be defective is an uncle. The superficial and deep reflexes, as well as the sensations, are normal and the cranium is asymmetrical, being larger in the left occipital region. It is also narrow and irregularly so. It is micro-cephalic. The measurement of the circumference being proportionately smaller than that of the bin-auricular or naso-occipital. The right ear stands out a greater distance from the head than the left. The palate is narrow and highly arched.

The third case, R. S., is twenty-eight years of age; an American. He is thirty-eight inches high, and weighs ninety-one pounds. His superficial and deep reflexes are sluggish, and his sensations apparently normal, except giving a slow response. He is an imbecile, his intellectual development being about equal to that of a three year old child. There is little personal or family history obtainable, except that he has been feeble-minded all his life. In reporting the case of the little girl I said she had a defective uncle. This is the uncle. He has always been irritable and subject to occasional fits of anger, which became so accentuated as to make him at times uncontrollable and dangerous, for which reason he was three years ago committed to the asylum for restraint. Since his admission, his physical health has been excellent, and under the daily routine

and restrictions his disposition has been constantly agreeable. His physical makeup is a fair specimen of what we would term a monstrosity. He has a macro-cephalic head, the circumference measuring 58½ c. m., 52 being the average. The bin-auricular measurement is 34½ c. m., 32 being normal. The naso-occipital measurement is 41 c. m., 32 being normal. His trunk is not far from normal in size, but his limbs are far short of their normal length. His voluntary muscular action is greatly impaired. All his voluntary movements are characterized by awkwardness and clumsiness. His articulation is tardy and imperfect. He has always suffered from enuresis and sometimes had had night terrors. He looks like an accident, but he is not. There are no hereditary or somatic accidents. With the quality of elements that made him he could not have been different. When the spermatazoa impregnates the ovum the union determines an inevitable result based upon the qualities and peculiarities of the components forming the union. During its nourishment, growth and development modifications are possible, but only within its unchangeable limitations. Of the stigmata exhibited in these three cases, and others previously mentioned, some deserve special mention by reason of their greater significance. It is claimed that the asymmetrical head, the deformed palate and the misshapen and misplaced ear are the strongest indications of serious degenerative defects, and in the order named.

Epilepsy is one of the neuroses known to be of great and serious significance from the standpoint of a bad organization. Neurasthenia is probably none the less so. We are reminded that neurasthenia and allied neuroses are often acquired. So is tuberculosis, and as its acquisition is generally made possible by reason of a transmitted susceptibility, so is the acquisition of neurasthenia generally made possible by reason of some element of neurotic heredity. All strumous diatheses, as well as all exhaustive neuroses, have a degenerative tendency. They are each transmitted weaknesses acting synergistically in their likelihood of transmission and are interchangeable, and if extended will surely and rapidly reach the ultimatum of the degenerative tendency—annihilation of the stock.

Those individuals in whom bad organizations are eliminated enjoy endurance undreamed of by the unstable; still, constant excessive demands made upon any nervous system by over mental work and anxiety, or by disease, will finally result in deprivation, starvation, dwindling and decay of the recuperative or trophic nervous centers, and will so seriously affect metabolism as to bring about a breakdown, and will more seriously affect his posterity by reason of the diminished transmitted recuperative force. The sympathetic asthenia signaled by loss of control of the great involuntary functions which preside over metabolism opens up the likelihood of affecting seriously the integrity of that other involuntary function (all-important to posterity) of producing the germ with normal vital and trophic potentialities.

Strong, robust individuals may, by constant overstrain, so use up the force of their trophic nervous centers as to cause them to assume a weakened and atrophied condition directly transmissible to their offspring. The vital elements which should go into and form a potential quality of the spermatazoa have already been used up in the continued nervous strain, and the starved and exhausted trophic centers are transmitted with diminished integrity, resulting in a posterity of neurotics and physical degenerates.

Past history seems to bear out this idea, in the fact that so many great men, great by reason of much and prolonged hard work, have left a posterity among whom are often found debilitated physiques, exhaustive neuroses and other degenerative manifestations.

It would seem that each healthy individual has certain circumscribed possibilities and limitations. Within these limitations much variation may be indulged, in subserving to environments, necessities and opportunities, without serious detriment, and sometimes with much benefit. Normal exercise of a function is helpful. Continued exhaustion of it is destructive. Great wealth with its attending opportunity for luxury, inactivity and dissipation is a fruitful source of degeneracy.

Where in ancient history do we find evidence of multiplied numbers of health resorts for the tuberculous, the neurasthenic and the

neurotic? Among primitive families, when all had to do manual labor for their subsistence, there was no demand for the sanatoria. The physical labor and its normal fatigue and consequent rest took their place. The people ate plain food, and had time in which to assimilate it, and when night came they would seek rest for their tired muscles, when nutrition would make adequate repairs, and the daily output reinstated. The trophic nerve centers were not continually exhausted by insomnia and worry, nor starved and poisoned by the result of indigestion and auto-intoxication incident to bolting the food over-seasoned and eaten in too great quantities, by the very reason of underassimilation, and also incident to sedentary lives, from early life when children are made hot-house plants, and up through a stuffed and crowded school life and on through a life vocation requiring constant rush and over-mental and nervous strain, and all with little attention to physical development and hygiene. Now we have numerous health resorts and sanitaria, where people are constantly and eagerly spending their time and money trying to buy back that which was previously given either by themselves or by their ancestors in exchange for their wealth and position, viz.: health.

Other things being equal, the best man is also the best animal. A healthy physical individual, though he were to be negative spiritually, possesses more potentialities for the good of future humanity than does a man strong spiritually and morally, who is a physical weakling. The normal physical man, normally maintained, will hand down to posterity a normal physical and moral individual, capable of harmonious adaptation to his relations with nature; while the physical delinquent will hand down neurotics, degenerates and criminals, all entirely out of harmony with nature and incapacitated for the fulfillment of normal moral and social obligations.

Through modern civilization's high pressure methods the brain and nervous system is constantly becoming more highly organized at the expense of the physical development, which comes normally from physical labor, and a dissemination of degenerative attributes

is the inevitable result. They are modified products of nature's great law of evolution, which perpetuates all things normally except where warped and weakened by extraneous circumstances. Just as each year is marked by certain seasons during its passing, so the world and all time in history is marked by certain periods, each represented by a succeeding generation. The natural course of evolution determines the type of humanity for each particular period. Any individual not coming within the requirements of the type of this particular period is out of harmony with his age and not normal, though he might have been a normal product in primitive days. The condition is something akin to reversion, and these degenerative stigmata, which he is likely to present, are probably representations, or relics, as it were, of some primitive type, a varying number of links of the long chain of evolution having been dropped.

In seeking for deliverance from these universal and ever increasing defects, society and humanity have only the medical profession to look to. There are two methods by which we may assist nature to accomplish results. First, by checking bad heredity; second, by improving the condition of the present defectives.

The first object may best be accomplished by a more liberal education. Give the people a broader knowledge and conception of nature and its great laws. Teach them that they must avoid serious matrimonial mistakes; that Divine Providence does not direct nor vouchsafe the results of such mistakes; that their children are only unavoidable results of their combined natures, and not sentimental gifts from God. Teach them how to detect weak points in others, that they may avoid unfortunate unions; teach them some of their own weaknesses, that they may anticipate them in their children by proper care, direction, nutrition and education during their development. Teach them that not all children have the same capacities and temperaments, that some positively require restrictions and training not even bearable by others; that some can spend more hours in the school room than others. Indeed, some children should never spend one day in the school room. We sometimes

seem to see a manifestation of nature's demand for its rights when some strumous child rebels against all attempt and persuasion to keep him in school. Force him to stay there and you make a neurotic or criminal of him, or doom him to early death. Put him out on the prairies and nature will educate him, not in literature, but in the practical problems of life, and will fortify him against his weak tendencies, and make a man of him. As means against faulty hereditary transmissions, legislative enactments are often mentioned. This is impractical except to a limited degree, which should be maintained as far as possible; but education, not classic, but of nature, is the opportunity.

The second object—to improve the condition of the present defective—is a fruitful field. For the correction of the anatomical stigmata little can be done, except occasionally through plastic surgery, in such cases as hair-lip, cleft palate, syndactyle, etc. For the correction of physiological stigmata much may be accomplished in such conditions as stammering, stuttering, backward tendencies, the various convulsive tics, etc., by constant training, development and education. The results will be slow, but certain, if persisted in. For the psychic manifestations, and especially where dependent upon the exhaustive neuroses, very much, indeed, may be done. Strike primarily at the impaired nutrition. Treat vigorously any existing diathesis or cachexia, change the occupation, mode of living and place of abode. Put them in a new atmosphere with entirely changed environments. Give them plain food, abundantly supplied; remove all nervous strain, and enforce mental rest. Prescribe active physical exercise, alternating at short and regular intervals with absolute rest, preferably in bed. Give him cold baths and massage. This is the very best tonic to be had. Electricity will be found of value in certain select cases. All these efforts will accomplish much in adults. In children much more may be accomplished, and the younger the child the greater the opportunities. Spring flowers which come up in autumn are out of season, they can never reach their normal development and beauty at this season, and if unaided they may decay and die before they blossom.

The florist takes them and makes new surroundings for them, puts them in flower houses and waters and cultures them, making their surroundings those of spring time, and they flourish and attain to all the characteristics of the beautiful spring flower. This they could not do perfectly if the seed, too, were of a faulty kind. In that case he would not expect perfect plants, knowing that by proper nurture and care their growth and beauty can be greatly improved, but not made perfect. The degenerate is a specimen of humanity out of season, and is also of inferior stock. He is incapable of attaining to that beauty and splendor of normal, robust, mental and physical development, but through proper care, training and nurture, by skillful hands, his natural trend can be greatly improved upon and his kind, if permitted to be perpetuated at all, should be placed in good soil and healthful atmosphere. This, together with skillful care and direction, may finally eliminate all blemishes.

Certain stocks of common range horses are of certain known fixed standard in size and speed. Take their colts and starve them and allow them no exercise, and they will be small ponies, clumsy and awkward. On the other hand, feed them well and train them from the time they are very young and they will grow larger; continue feeding and training this stock for a few generations and the natural type becomes far superior to the original type, both in size and speed.

By an early individual observation and study of each child, and a familiarity with the attributes of its ancestors, it can be so nurtured, developed and trained as to reach great improvement during its lifetime. Continue these efforts through a few generations and its type becomes a permanently superior one. Finding a child to be subject to convulsions from trivial causes, or suffering from night terrors, somnambulism, enuresis, strabismus, chorea, hysteria, scrofulous tendencies, etc., it is our imperative duty to obtain its personal and family history as early and as completely as possible and institute vigorous measures—corrective, nutritional and developmental—remembering at the same time that if proper nutrition

will help an unhealthy child, it will also help healthy ones, and make their future possibilities still greater.

DISCUSSION.

DR. J. M. NICKS, Stone City: I want to say that I am very glad the doctor presented these cases to us. I have long made observations on this subject, and I am glad that my attention has been called to them. This is a very interesting paper.

DR. W. W. MACGREGOR, Laredo: I am very much pleased with the doctor for showing us these cases, which illustrate a long felt want—that is, the education of the public, especially the general educational part of the State in matters of this kind, and I would like to see this paper published and given wide distribution and circulated among all the school trustees of the State at the expense of the society.

I think it is a very important matter that people should be educated in regard to the care of children. We have our public schools with all their facilities and everything, but oftentimes negligence in regard to those matters which contribute to the welfare of the child when it grows up. The long hours that they have; the child can not spend long hours in recitations and then spend half the night in preparing recitations for the next day. Not that they intend to injure the growing child, but they do not understand that the physical culture of the child and the intellectual culture should go together. The old saying, "Mena sana in corpora sano—if you have not a sound body you have not a sound mind," and the care of the physical nature of the child is just as important as the educational qualifications, because if they have not a sound body and a sound physical frame they are not able to carry out their function in life and not able to use their brain, because the brain is just as much a physical organ as the stomach, and it is as important to take care of the brain as it is to take care of the liver or the same as they care for their bowels or anything else.

THE PLEA OF INSANITY BEFORE OUR COURTS.

R. B. SELLERS, M. D.,

COMANCHE, TEXAS.

A perfectly normal mind seldom exists; in fact the statement has been made by scientists that such a condition as mental perfection is never reached—that notwithstanding the great heights of mentality which men attain, there is an unbalanced mental condition in every one.

Such conditions we see when we are brought into daily companionship with people; when we notice more clearly their mental imperfections shown by their violent outbreaks of temper, their peculiar views on subjects which give them the name of cranks, their mulish obstinacy when their position can readily be shown incorrect, their oddities in personal appearance and other things we call peculiar.

The idiosyncracies are not generally termed insanity, and we pass them without any serious thought of them being mentally abnormal.

Just where sanity ends and insanity begins is a matter of deep concern. That insanity is as much of a disease as is typhoid fever, pneumonia or smallpox, we all know. The delirium, the raving and the irresponsibility of a person suffering from any of the acute fevers, could not be termed insanity, for such conditions are only temporary. While "insanity is a prolonged departure from the normal, in the way of acting, thinking and feeling," and when such is the state of an individual, the law does not hold him responsible for any act or crime he may commit.

There is a feeling of horror in the minds of all, when an insane man suffers capital punishment, yet there are some very prominent cases in the history of our country where such has been done. Let me call your attention to two, the first being that of Guiteau, the

assassin of President Garfield. From the press reports of testimony taken in the case, and subsequent facts that have developed, I believe that we must acknowledge that Guiteau's actions were those of a man suffering from delusional insanity. He had always been considered queer by his friends—he had been in the employment of the government for years, and for some cause he lost his position.

Though the President was entirely ignorant of such conditions, and probably had never heard of the man till after his discharge, yet this Guiteau had formed the opinion that it was a personal injury and insult which the President was inflicting on him, and under this fixed delusion he shot Mr. Garfield.

The second case is that of Czolgosz, the murderer of President McKinley.

In both of these cases the plea of insanity was entered at their trials, but both were declared sane, and executed.

Let us look for a moment at the last case. In a very able article written by an Eastern physician, and published some months ago in the *Arena,* it was clearly shown from letters and interviews gathered after his execution that he was suffering from organized delusions, a form of insanity that is incurable and very dangerous. This history shows him to have always been a peculiar boy—shunning the company of people, especially that of girls. He had worked hard for years till his health had broken down; he then became suspicious of his family and friends; he was morose and secretive, had delusions and hallucinations, and would always take his meals alone, especially when certain members of the family were at home. When he went to Chicago, a short time before he killed Mr. McKinley, he became an anarchist, but they were always suspicious of him, and while there he kept to his old habit of eating alone. He then became impressed that it was his duty to kill the President, and thus save his country. He was examined by some of the leading alienists in this country and pronounced sane, yet we must acknowledge that the trial was hasty, the hour a trying one, and that public sentiment was against the man. And still I fully

believe if he were living today and could undergo a careful examination by the same men, that after a more thorough investigation of his former life and habits, he would be declared insane. I speak of these two cases to show you wherein the law was too hastily executed, through what I believe to be mistakes made by the examining physicians.

At the present time, the plea of insanity is entered in our courts by many who try to use it as a cloak to shield them from the extreme penalty of the law—claiming through their counsel that the crime was committed while temporarily insane or under the influence of alcohol.

There are two points of our present law in the defendant's favor —one is that a man can not be punished for a crime committed while insane, and his counsel can usually prove that that was the condition of the prisoner at the time of committing the deed. Again, the law supposes a man is innocent till his guilt is established beyond a shadow of a doubt by twelve of his fellow men.

As the court and jury have no way of judging of the sanity or insanity of the defendant except by his actions, and through the testimony of physicians and other witnesses, it is very difficult to get a conviction in a case where insanity is the plea, even if we feel confident that the fellow is a fraud.

Illustrating very forcibly the thoughts of this paper, is a very interesting case recently tried in Bexar county. In this case, styled "State of Texas vs. Gallagher," tried in Bexar county, on a change of venue from Galveston county, the defendant was accused of killing his mother, and a plea of insanity was entered by the counsel of the defendant, claiming that while under the influence of intoxicants or perhaps drugs administered in the drinks, he had become temporarily insane and committed the crime; also that the defendant had delusions of persecutions.

In rebuttal of this testimony, the State showed that his mind had always been good, that he had intelligence enough while drunk to go back to his mother's home for the purpose of stealing money from her, and while in the act of taking it, his mother

moved or spoke, and thinking he was caught in the act of stealing, he killed her. He hid the crime for over twenty-four hours, telling several that his mother was not very well. He showed nothing unusual in his conduct, went to town, and helped take an injured man from the ambulance at the hospital, and then set fire to his house; three times trying to cover up his crime. The court held that he was responsible, and a verdict for conviction was secured.

It often takes much patience and great diligence to find out if the insanity be genuine or feigned, and it is wonderful how many ways the prisoner, if feigning, will devise to show that he is insane. He will act crazy, talk in broken or unintelligent sentences, or refusing to speak, taking no care of his clothes or his person; refusing food and water to the point of starvation, often being fed with a tube; trying to commit suicide; butting his head against the bars of his cage; biting and bruising himself in all manner of ways; affecting epilepsy, acute mania or melancholia in its worst form; he may lay for hours and days in an apparently semi-comatose condition, simulating insanity so perfectly that it will almost deceive the elect.

There is always a peculiar thing about one who is acting his part; he will eventually overdo it; in some small but important way he will show to one skilled in the study of insanity that he is putting on. He may play his part so well that the officers who have him in charge believe that he is insane. Take for instance the celebrated insurance swindle case, so recently tried in El Paso, in which one of the defendants played crazy so perfectly that after an alienist of ability had pronounced the man sane, the officers of the county still believed him insane.

So many frauds have been perpetrated, and the guilty have escaped punishment under the plea of insanity,—they being sent to an asylum for a year or two,—that such a trial has become a burlesque and byword among lawyers. No matter how guilty a man may be, if he can escape the punishment of the law by being sent to an asylum, when he is discharged from that institution he is free from all stain of crime as far as the law is concerned; and he

is at liberty to commit other crimes and escape further punishment, other than an indefinite confinement in an asylum, by reason of a so-called recurrent attack of insanity.

It is impossible to convict a man of a crime, no matter how guilty he may be, if he has been an inmate of an insane asylum, and that fact is known by his lawyer; he will always plead a recurrence of the disease, the prisoner escaping the penitentiary or hanging, and is sent back to the asylum for a few years.

To correct this great evil, to protect the man who is insane, by sending him to an asylum where he can have proper care, and send the one who is simulating insanity to his just punishment, should be the desire of the medical profession of this State. To offer plans for such an adjustment is the main thought of this paper, and two ways present themselves to my mind.

First. There can only be one way of finding out if a prisoner is feigning insanity or not, and that is by careful, continued and exhaustive examinations by men who are capable to pass on the case in question, they being qualified for such work by their continual caring for and associating with the insane in asylum life.

To attain this end, there should be a lunacy board in this State, composed of the superintendent of each insane asylum; each member of this board being empowered to act separately, except where the case demands the presence of the entire board.

Then when a man enters a plea of insanity, he should be taken from jail and carried immediately to an asylum, when he can be watched and his case studied by the superintendent and his medical assistants. The case may be of such a nature that it may take quite a while to decide if the man is insane or not. In the asylum, away from all jail surroundings, which at best are bad, the prisoner will be under the watchful care of physicians who do nothing but study insanity, and a correct solution of his case will be made much sooner than under other conditions.

If the man be found sane, he then should be sent back to the courts for trial. During his stay in the asylum, he should not be looked on as a patient of the asylum, but as a prisoner of the court

in the asylum under observation. If the prisoner be found insane by this board of lunacy, the charges in the court should be dismissed against him and he be entered as a patient of the asylum.

This brings me to consider the other main thought in this paper, that of a hospital for the criminal insane. The great majority of criminal insane are incurable, and under proper management their confinement in an asylum practically means imprisonment for life.

Under the present law of this State, we can make no distinction in caring for the insane, and are forced to have all classes and forms of insanity together; the man suffering from a mild attack or melancholia, or an acute outbreak of mania, is compelled to associate and be confined with the insane criminal.

There are in the asylums of this State many people who could be classed as criminal insane, and though they have never been guilty of any crime, they have that form of insanity that if they were not under restraint, as their delusions grew stronger or more systematized, they would resort to some form of crime against their supposed enemies. This class should not be kept in a general asylum, but should be confined in an institution for the criminal insane.

The carrying out of these ideas would, to my mind, harmonize all feeling on this subject, making it impossible for a prisoner to escape punishment through the plea of insanity, unless he be insane.

SECTION ON STATE MEDICINE AND PUBLIC HYGIENE.

CHAIRMAN'S ADDRESS.

F. PASCHAL, M. D.,

SAN ANTONIO, TEXAS.

It is impossible, in a brief address on State Medicine, to do more than direct attention to a few interesting and important subjects encompassed in this broad field. A review of the achievements during the past ten years should encourage us to continue the good work of bettering public health, and on the other hand, it will convince us that much yet remains undone by our profession, which I think should be done, in the furtherance of our noble purpose—benefiting mankind.

The first and most important thing to judge whether a country is advancing in civilization, and all that goes with it, is whether its death rate and birth rate are increasing or decreasing, for there is no doubt that a country's prosperity depends not alone upon its accumulating wealth, and commercial advancements, and industrial pursuits, but also upon its healthfulness, which is guaged by the death rate and birth rate.

That this great government of ours, of which every citizen should be proud, is fully alive to the necessity of employing every means to protect public health, and which we as physicians play no insignificant part in designing, is evidenced by the fact that the past decade shows that there has been a decline in the death rate during the year 1900, as compared with 1890, from 19.6 per 1000 population in 1890 to 17.8 per 1000 population in 1900. The decrease was greatest in the cities. The necessity of protecting public health by sanitary improvements and regulations is first recognized in

places where the population is most dense, and personal contact most close and frequent. The decrease of deaths shows the effect of the advances made in medical science and sanitation, and in the preventive and restrictive measures enforced by local health authorities.

It is gratifying to know that the death rate is less in the United States than in most of the foreign countries.

The wonderful effect protection of public health has upon the reduction of mortality is shown by the measures adopted in the city of Buffalo. In 1890 the death rate in Buffalo was 18.4, in 1900 it was 14.8—the greatest decrease in deaths occurring in children under five years of age, the largest percentage of decrease being in those under one year. This is attributed to preventive and remedial agencies, summarized as follows: Control of the milk supply by licensing and supervising the milk dealer, inspection of outside dairies supplying milk, and exclusion of product of dairies in unsanitary condition.

The enforcement of strict regulations requiring the immediate reporting of contagious diseases (in which tuberculosis is included).

Inspection of infected premises, and strict quarantine of the same during the continuance of the disease, with complete disinfection after its termination.

One means of reducing infant mortality is stated as consisting of a circular of instructions concerning the care of infants, that was mailed to each mother in the case of every birth registered. The concensus of opinion of every city in the United States, where there was a reduced mortality, was that it was due to the advance made in medical and surgical knowledge, especially in the line of preventive medicine.

It is exceedingly gratifying to note that there has been a decided decrease of deaths from consumption in the United States during the past decade.

The total number of deaths reported, as due to consumption, during the ceusus year 1900, was 109,750, of which 53,626 were males and 56.124 were females, and the ratio of death from this

disease to 1000 deaths from all known causes was 109.9. In 1890, a corresponding ratio was 122.3. In comparison with 1890 the figures for 1900 show a large decrease in the death rate, amounting in the aggregate to 67.7 per 100,000 of the population of those 15 to 44 years old, 86.6 per 100,000 of the population for those 45 to 64 years old, and 108.9 per 1000 of the population for those 65 years old and over.

The bright side of a few of the achievements of medical science has been painted. The dark side of the picture must now be shown, namely: the enormous infantile mortality, and the low percentage of births of native born parents.

During the census year of 1900 there occurred, for all ages, 1,039,094 deaths, of which number 199,325 were under one year of age, 59,879 one year of age, 28,136 two years of age, 17,638 three years of age, 12,554 four years of age. It will be seen from this that an infant's chances of living upon attaining its first year is three time greater than before the first year is reached, and over seven times greater upon attaining its second year, and so on with increasing chances of living.

In studying the causation of deaths of infants under one year of ag, cholera infantum was found to have caused 18,389 deaths, and 55,756 deaths were due to the following general diseases, mostly preventable: Measles, scarlet fever, diphtheria, whooping cough, malarial fever, influenza, typhoid fever, cholera infantum, cerebro-spinal fever, smallpox, erysipelas, septicæmia, venereal diseases.

With the exception of diphtheria, the deaths from most of these diseases was over 100 per cent greater in infants under one year of age, and five times greater than they were at two years of age. Even in accidents and injuries, such as drowning and burning, the deaths from them were three times greater under one year than at one year of age.

The slaughter of the innocents, at the tender age of life less than one year, should give food for thought, and it seems to me that as philanthropists, if not as physicians, we could use every means in our power to protect the helpless ones. This can only

be done by proper education of the public to the necessity of increased care during the first year of infant life. We learn from the study of the causation of deaths in infants under one year of age, that the lessened resisting powers of infants at that age is by no means wholly responsible for thousands of deaths that should be prevented. To illustrate what education can do to prevent deaths, I may be pardoned for citing the following: During the months of May and June of 1899, there occurred, in the city of San Antonio, from acute intestinal diseases, 124 deaths, attributed chiefly to cholera infantum. In April, 1900, I had printed in English, German and Spanish languages, directions for the preservation of milk, and for the care of infants during the summer months. These circulars were placed at almost every household in the city. The deaths from acute intestinal diseases in infants under two years of age, in the months of Many and June, 1900, numbered 24, a decrease of 100 for the corresponding months of the pervious year.

I would urge that since the law in our State requires that births and deaths shall be reported, this Association take into consideration the advisability of adopting some method whereby mothers can be given clear and concise instructions upon the care of infants. Indeed, I believe this to be of such great importance that it should be recommended by the American Medical Association, and adopted in every registration State. If this were done, it is not improbable that Congress could be induced to pass an act permitting literature from boards of health and medical societies, bearing upon this subject, to be sent through the mail free, which, of course, would effect an enormous saving.

It is estimated that the excess of births over deaths during the past decade was 12,315,361. The birth rate in the United States is greater than in any other country, except Hungary. But, notwithstanding this fact, the annual rate of increase by excess of births in the class born of native white parents was 19.5 per 1000, while in those born of foreign parents it is 36.5 per 1000. The rate of the colored was less than those of native white parents, 17.8 per 1000.

In the northeast division, consisting of the States of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont, the rate of annual increase of children of native white parents was but 3.8 per 1000, while in those of foreign white parents it was more than ten times greater, 39.6. Excluding New York from this group, it appears that the annual death rate of native whites of native parentage exceeded the birth rate by 1.5 per 1000, while amongst those of foreign white parentage the birth rate exceeded the death rate by 44.5. The peculiar results noted seem to be confined to the New England States. In the remainder of the country, the excess of births was 21.1 of those of native white parents, 35.7 of those of foreign parents, and 17.9 of the colored. The nearest approach to equality in the rate of excess of births of native and foreign white parents was in the Southern States, where the proportion of foreign parents was least, native white parents 24.1, foreign parents 27.3.

It is to be trusted that the South will continue to furnish the greatest number of sons to our country, as the number of deaths in the Northeastern States, with the exception of New York, exceeds the annual birth rate of the native whites born of native parentage, hence the South will have to supply the North with native whites of native parentage.

These are matters upon which the public should be enlightened, and it behooves us to make known these facts and to urge a war of education, not alone upon the matters touched upon, but on all important measures in regulation of the public health. There should be medical teachings to the young collegians; they should be enlightened upon the dangers that beset them upon the very threshold of their lives; they should be warned of the dangers that may entail: "the sins of the fathers visited upon their children unto the third and fourth generation."

When we shall have employed our talents for the betterment of the public health, we can then look with pride and feel that the true aim and object of our lives has been accomplished, and that we have truly reflected credit upon our profession, and have practiced the greatest type of medicine—preventive medicine.

THE SIGNIFICANCE OF THE RECENTLY RECOGNIZED HOOKWORM DISEASE FOR THE TEXAS PRACTITIONER.

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Before discussing the subject of hookworm disease, it is a pleasant duty for me, first, to present to the President and members of your Association the compliments of Surgeon-General Walter Wyman, with his best wishes for a profitable annual meeting; second, to express to you my keen appreciation of the honor you have conferred upon me by electing me an honorary member of your Association; and, third, to thank you for the compliment you have shown to my investigations by requesting the Surgeon-General to send me over 1700 miles to address you this evening.

Hookworm disease, or uncinariasis, is by no means a new malady. In Ebers Papyrus, an old Egyptian manuscript written about 3500 years ago, we find a clinical picture described, which is practically identical with the condition which we now name hookworm disease. This disease is found in a number of different animals. In man it may be caused by either of two parasites: the Old World hookworm (*Agchylostoma duodenale*) causes it in the Old World, and the New World hookworm (*Uncinaria americana*) causes it in the New World. Cases caused by the Old World parasite occasionally occur in America, due to the importation of the parasite from Europe and the Philippines, and probably some cases in Spain will be found to be due to the New World parasite, since the Spanish soldiers who

*Detailed by Surgeon-General Wyman to represent the Public Health and Marine Hospital Service at the San Antonio meeting of the State Medical Association of Texas.

have returned from Cuba to Spain probably carried some of the worms with them.

In order to understand the disease it is necessary to understand the structure and life history of the parasites which cause it. These parasites are small, round worms, or nematodes, about half an inch long and about the diameter of a hat pin. They inhabit the small intestine, where, fastened to the mucosa, they suck the blood of the patient and at the same time undoubtedly produce a poisonous substance, which is absorbed by the afflicted person.

Their general anatomical characters may be seen from the diagnoses of the respective genera and species, and are clearly shown by the illustrations which I will throw upon the screen.*

ZOOLOGICAL POSITION OF THE PARASITES.

The parasites which cause uncinariasis are worms belonging to the nematode family Strongylidæ.

Family Strongylidæ.

FAMILY DIAGNOSIS.—Nematoda: With body elongate, cylindrical, rarely filiform. Mouth is probably always provided with six papillæ, of which the four submedian are generally salient in form of nodules or conical points. In some cases the mouth is in the axis of the body; in others it is turned dorsally or ventrally, and occasionally provided with a chitinous armature. Esophagus more or less swollen in posterior portion, but without forming in adults a distinct esophageal bulb. Male provided with a caudal bursa, open or closed, entire or divided, and with one or two spicules. Female with one or two ovaries; vulva anterior or posterior of equa-

*A more complete discussion of hookworm disease will be found in Bulletin 10, Hygienic Laboratory, United States Public Health and Marine Hospital Service. Application for copies should be made to the Surgeon-General, United States Public Health and Marine Hospital Service, Washington, D. C.

torial plane, in some cases near the anus. Eggs deposited during segmentation, in some cases containing embryo.

TYPE GENUS.—*Strongylus* O. F. Mueller.

The sexes are separate and the digestive tract is complete. Characteristic for the family is the presence, on the tail of the male, of an umbrella-like structure, known as the caudal or "copulatory bursa," supported by a number of finger-like "rays," which may be compared to the ribs of an umbrella. In coitu, the male clasps the body of the female by means of this bursa.

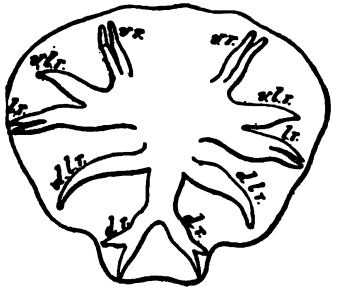


FIG. 1. Caudal bursa of a male strongyle (*Esophagostoma dentatum*), to serve as diagram for the family: *v. r.*, ventral rays; *v. l. r.*, ventro-lateral rays; *l. r.*, lateral rays; *d. l. r.*, dorso-lateral rays; *d. r.*, dorsal rays. X 93. (After Schneider, 1866, p. 130.)

This family is divided into subfamilies, according to the presence of certain anatomical characters. The parasites of uncinariasis are now classified in the subfamily Strongylinæ, which, as its former name, Sclerostominæ, indicated, is characterized by the presence of a hard chitinous "buccal capsule."

Subfamily Strongylinæ.

SUBFAMILY DIAGNOSIS.—Strongylidæ: Meromyaria; mouth with more or less complete chitinous armature. Male with two equal spicules; caudal bursa with rays, the dorsomedian and dorsolateral

being united in a common base. Female with two ovaries, except in *Ollulanus*.

TYPE GENUS.—*Strongylus* Mueller.

The subfamily Strongylinæ is in turn divided into a number of genera, of which we may mention here the following:

Strongylus [*Sclerostoma*]; the sclerostomes, including the colic worms of horses and the kidney worms of hogs (but not the kidney worms of dogs and man);

Syngamus, including the gape worms of chickens; and

Uncinaria, the hookworms, including the parasite of uncinariasis.

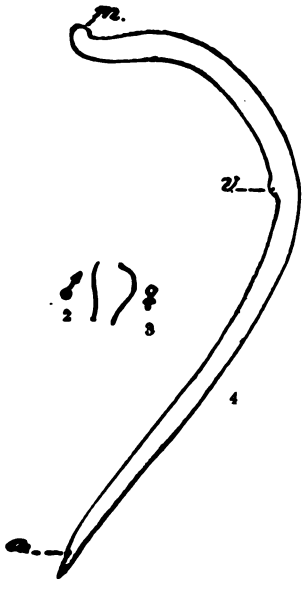
Genus Uncinaria Frölich, 1789.

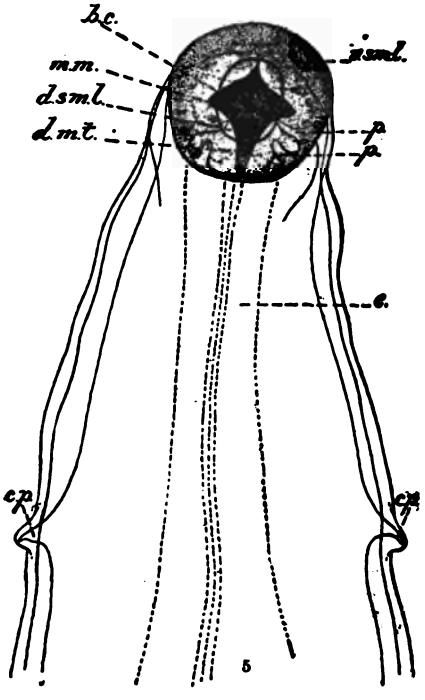
GENERIC DIAGNOSIS.—Strongylinæ: With anterior extremity curved dorsally; mouth round to oval, opening oblique, limited by a transparent border and followed by a chitinous buccal capsule; the dorsal portion of the capsule is shorter than the ventral, and is supported by a conical structure, the point of which sometimes extends into the cavity; at the base of the buccal capsule are found two ventral teeth; toward the inner free border the ventral wall bears on each side of the median line chitinous structures, lips (*Uncinaria*) or teeth, often recurved in shape of hooks (*Agchylostoma*); the inner dorsal wall may also bear lips or teeth. Oviparous, eggs with thin, transparent shell.

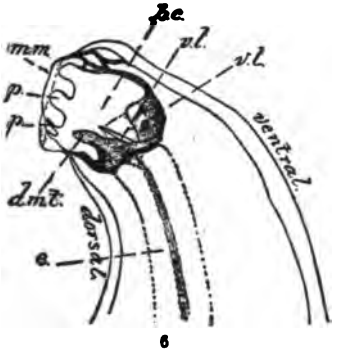
TYPE SPECIES.—*Uncinaria vulpis* Frölich, 1789.

The anatomical character which distinguishes the genus *Uncinaria* is the dorsal curvature of the anterior extremity of the body, due to the shortness of the dorsal wall of the buccal capsule and resulting in bringing the mouth into a dorsal instead of a terminal or a ventral position.

This genus must undoubtedly soon be divided into several genera, and the American parasite will probably be taken as type of a distinct genus. For the present, however, it will suffice to recognize two groups, *Uncinaria* and *Agchylostoma*.







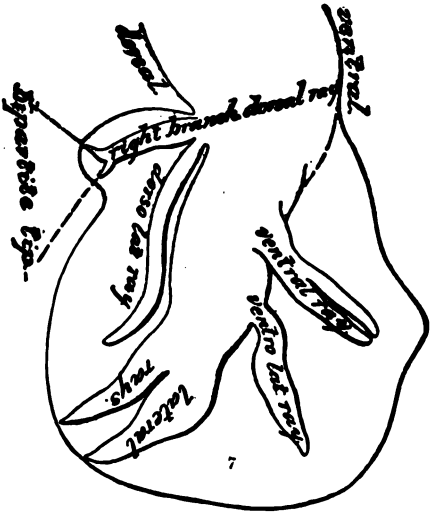


FIG. 2. New World male hookworm (*Uncinaria americana*). Natural size. (After Stiles, 1902b, p. 190, fig. 120.)

FIG. 3. New World female hookworm (*Uncinaria americana*). Natural size. (After Stiles, 1902b, p. 190, fig. 121.)

FIG. 4. The same, enlarged to show the position of the anus (*a*) and the vulva (*v*). (After Stiles, 1902b, p. 190, fig. 122.)

FIG. 5. Dorsal view of anterior end of New World hookworm (*Uncinaria americana*): *b. c.*, buccal cavity; *c. p.*, cervical papillæ; *d. m. t.*, dorsal median tooth, projecting prominently into the buccal cavity; *d. sm. l.*, small dorsal semilunar lip; *e.*, esophagus; *m. m.*, margin of mouth, the prominent oval opening seen upon high focus; *p. p.*, papillæ; *v. sm. l.*, large ventral semilunar lips homologous with the ventral hooks of *A. duodenale*. Greatly enlarged. (After Stiles, 1902b, p. 190, fig. 123.)

FIG. 6. Lateral view of anterior end of New World hookworm (*Uncinaria americana*): *b. c.*, buccal cavity; *d. m. t.*, dorsal median tooth, projecting prominently into buccal cavity; *e.*, esophagus; *m. m.*, margin of mouth; *p. p.*, papillæ; *v. l.*, ventral lancets at the base of the buccal cavity, the left lancet is seen *en face*, the right lancet is seen from the side. Greatly enlarged. (After Stiles, 1902b, p. 190, fig. 124.)

FIG. 7. Lateral view of caudal bursa of the New World male hookworm (*Uncinaria americana*), showing the arrangement of the rays. Note the short dorsal lobe. Greatly enlarged. (After Stiles, 1902b, p. 190, fig. 125.)

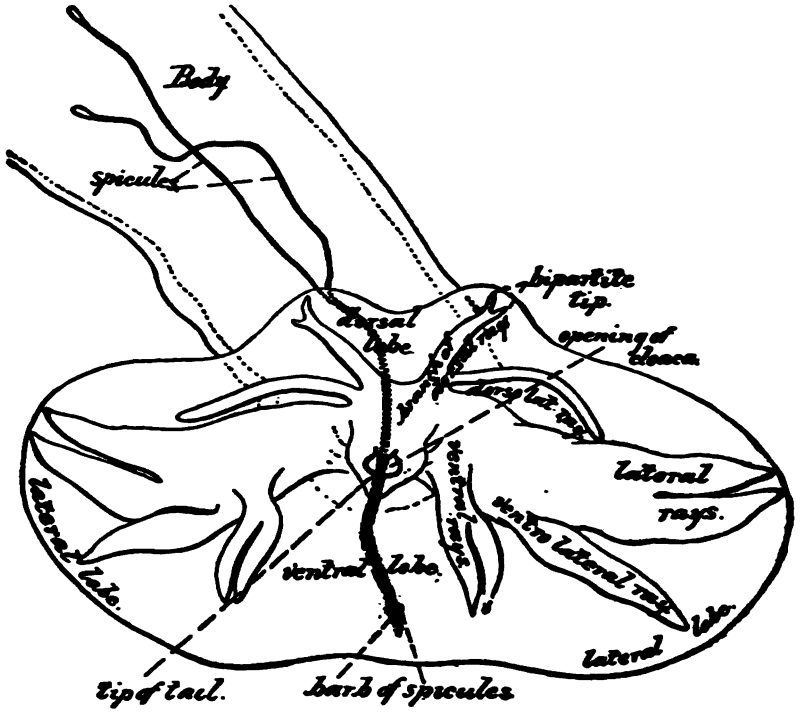


FIG. 8. The caudal end of the New World male hookworm (*Uncinaria americana*). The bursa is spread out to show the arrangement of the rays. Note the short dorsal lobe which is subdivided, forming two lobes; note also the indistinct ventral lobe connecting the two lateral lobes. The dorsal lobe is thrown back over the body. Greatly enlarged. (After Stiles, 1902b, p. 191, fig. 128.)

[*Uncinaria Frölich, 1789, sensu stricto.*]

DIAGNOSIS.—*Uncinaria* s. l. with buccal lips.

TYPE SPECIES.—*Uncinaria vulpis* Frölich.

The New World Hookworm—Uncinaria Americana Stiles, 1902,—of Man.

(Figures 2 to 9.)

SPECIFIC DIAGNOSIS.—*Uncinaria:* Body cylindrical, somewhat attenuated anteriorly. Buccal capsule with a dorsal pair of promi-

nent semilunar plates or lips, similar to *U. stenocephala,* and a ventral pair of slightly developed lips of the same nature; dorsal conical median tooth projects prominently into the buccal cavity, similar to *Monodontus.* Male, 7 to 9 mm. long; caudal bursa with short dorso-median lobe, which often appears as if it were divided into two lobes, and with prominent lateral lobes united ventrally by an indistinct ventral lobe; for rays, see figures 7-8; common base of dorsal and dorso-lateral rays very short; dorsal ray divided to its base, its two branches being prominently divergent and their tips being bipartite; spicules long and slender. Female, 9 to 11 mm. long; vulva in anterior half of body, but near equator. Eggs, ellipsoid, 64 to 76 *u* long by 36 to 40 *u* broad, in some cases partially segmented in utero, in other (rare) cases containing a fully developed embryo when oviposited.

HABITAT.—Small intestine of man (*Homo sapiens*) in America (determined to date, for Virginia, North and South Carolina, Georgia, Florida, Alabama, Texas, Porto Rico, Cuba and Brazil).

TYPE SPECIMENS.—No. 3310, B. A. I., U. S. Dept. Agric.

LIFE HISTORY OF UNCINARIA AMERICANA.

The life history of the American hookworm has not yet been determined in detail, but there is no reason for assuming that it will differ radically from that of *Agchylostoma duodenale* (see p. 364).

In my first description of the worm I stated that the egg in the uterus may occasionally contain an embryo. Since making this observation on the females sent to me by Dr. Allen J. Smith I have examined hundreds of fresh eggs, but have not found any containing developed embryos. The question may therefore legitimately arise whether the females originally examined were not exposed to the air for some time before they were preserved, thus making the development of the eggs possible. If the embryo does develop in the uterus, as indicated by some of Dr. Allen J. Smith's material, such an occurrence is undoubtedly rare.

FIG. 9. Four eggs of the New World hookworm (*Uncinaria americana*), in the 1, 2, and 4 cell stages. The egg showing 3 cells is a lateral view of a 4-cell stage. These eggs are found in the feces of patients and give a positive diagnosis of infection. Greatly enlarged. (After Stiles, 1902b, p. 122, fig. 127.)

DEVELOPMENT OUTSIDE THE BODY.

Segmentation.—In feces exposed to a September, October or early November temperature of the Carolinas, Georgia and Florida, the embryo develops in the egg (fig. 9) in about one day's time. In some instances the embryo develops in less than twenty-four hours. It is a common occurrence to find feces twenty-four hours old containing free embryos.

The conditions under which the trip was made were not favorable to exact observation in regard to temperature, moisture, etc. It was, however, possible to find worms in their first ecdysis about two to three days after hatching, and worms in the second ecdysis about seven to nine days after hatching. These observations were made under most unfavorable circumstances, when careful measurements, drawings, etc., were excluded, hence they should be repeated.

DEVELOPMENT INSIDE THE BODY.

Experimental infections during the trip were, of course, impossible.

[*Agchylostoma* Dubini, 1843.*]

DIAGNOSIS.—*Uncinaria:* Provided with ventral recurved teeth.
TYPE SPECIES.—*Agchylostoma duodenale* Dubini, 1843.

The Old World Hookworm—Agchylostoma Duodenale Dubini, 1843, or Uncinaria Duodenalis (Dubini) Railliet, 1885—of Man.

(Figures 10 to 41.)

SPECIFIC DIAGNOSIS.—*Agchylostoma:* Body cylindrical, somewhat attenuated anteriorly. Buccal cavity with two pairs of ventral teeth curved like hooks, and one pair of dorsal teeth directed forward; dorsal rib not projecting into the cavity. Male, 8 to 11 mm. long; caudal bursa with dorso-median lobe, and prominent lateral lobes united by a ventral lobe; for rays, see fig. 14; dorsal ray divides at a point two-thirds its length from its base, each branch being tridigitate; spicules long and slender. Female, 10 to 18 mm. long; vulva at or near posterior third of body. Eggs, ellipsoid, 52 to 60 *u* by 32 *u*, laid in segmentation. Development direct without intermediate host.

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*There are numerous ways of spelling this word, more than one with more or less philological authority. Under these circumstances I adopt the original orthography, despite the fact that it is not philologically correct. By this action I do not intend to necessarily reject the ruling covered by the International Code, but from practical experience I find it impracticable to carry out said rule in reference to the emendation of names until the question of homonyms is decided.

FIG. 10. Dorsal view of the anterior end of the Old World hookworm (*Agchylostoma duodenale*) of man. Greatly enlarged. (After Perroncito, 1882, p. 339, fig. 140.)

FIGS. 11-12. Old World male and female hookworm (*Agchylostoma duodenale*) of man. Natural size. (After Stiles, 1902b, p. 187, figs. 115, 116.

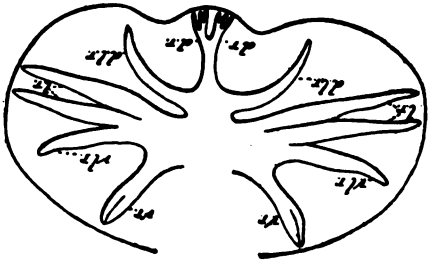


FIG. 14. Semi-diagrammatic figure of the caudal bursa of an Old World male hookworm. (*Agchylostoma duodenale*) of man. (After Railliet, 1886, p. 357, fig. 247.)

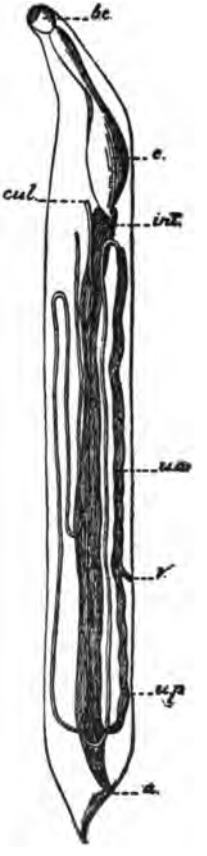


FIG. 13. Old World female hookworm (*Agchylostoma duodenale*) of man, greatly enlarged diagram to show the anatomy: *a.*, anus; *b. c.*, buccal capsule; *cul.*, cul de sac of ovary; *c.*, esophagus; *int.*, intestine; *u. a.*, anterior uterus; *u. p.*, posterior uterus; *v.*, vulva and vagina. (After Schulthess [copied from Blanchard, 1885a, p. 761, fig. 374.])

HABITAT.—In small intestine of man (*Homo sapiens*); also alleged to occur in certain apes. Africa, Europe, Asia, Philippines, introduced into America.

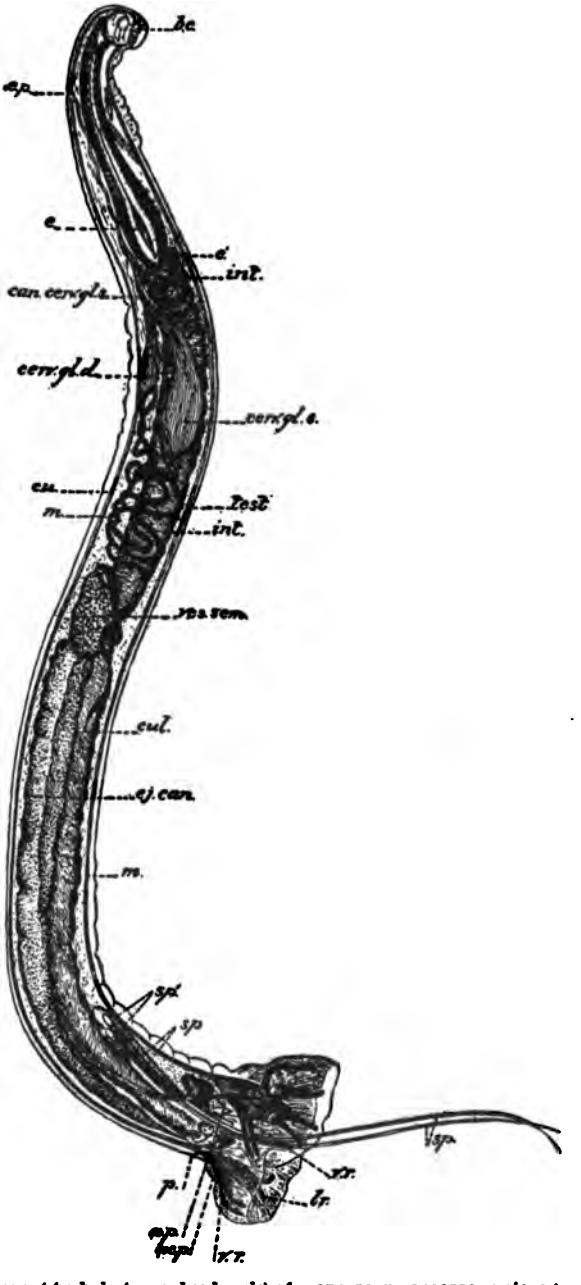


FIG. 15. Male hookworm (*Agchylostoma duodenale*) of man; *ac. p.*, accessory piece to spicules; *a. p.*, "anal papilla;" *b. c.*, buccal capsule; *can. cerv. gl. s.*, canal of left cervical gland; *cerv. gl. d.*, right cervical gland; *cerv. gl. s.*, left cervical gland; *cu.*, cuticle; *cul.*, cul de sac of testicular tube; *e.*, esophagus; *el.*, posterior end of esophagus; *e. p.*, ventromedian excretory pore; *ej. can.*, ejaculatory canal; *int.*, intestine; *l. r.*, lateral ray of bursa; *m.*, muscular layer; *p.*, lateral præcaudal papilla; *sp.*, spicules; *sp'*, anterior end of spicules; *test.*, testicular tube; *ves. sem.*, vesicula seminalis; *v. r.*, ventral rays of bursa. Greatly enlarged. (After Schulthess [copied from Blanchard, 1888a, p. 755, fig. 370.])

LIFE HISTORY OF AGCHYLOSTOMA DUODENALE OR UNCINARIA DUODENALIS.

The eggs (fig. 16) are laid in the intestinal tract of the patient by the female worms and are discharged in the feces, either unsegmented or during the early stages of segmentation. They will not develop into adult worms in the intestine, but must first pass out of the body. Thus, for every adult hookworm present in the bowels a separate germ must enter the body.

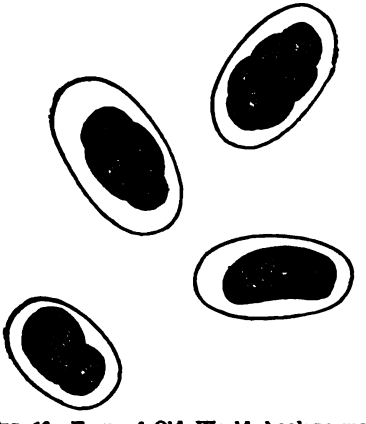
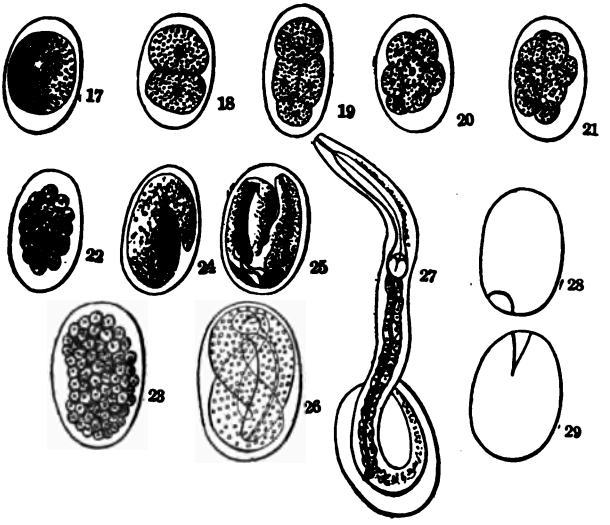


FIG. 16. Eggs of Old World hookworms (*Agchylostoma duodenale*) as found in the stools. Greatly enlarged. (After Stiles, 1902b, p. 193, fig. 128.)

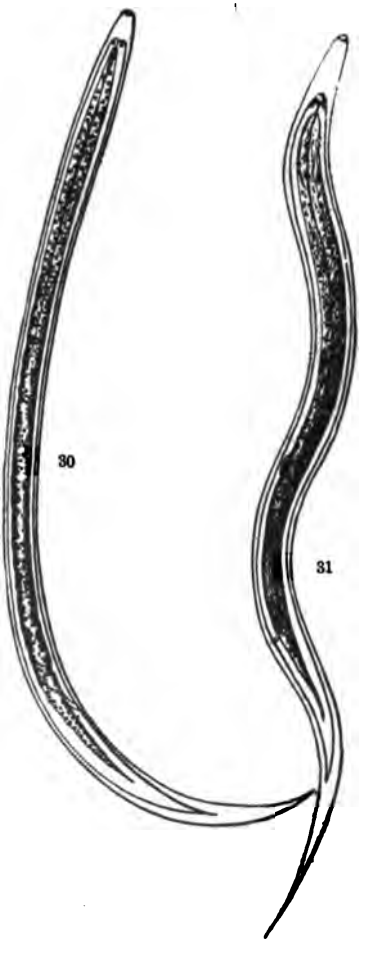
The egg has a thin shell, which is an indication of a simple life cycle. A short time after escaping in the feces—the time varying according to temperature, moisture and position in the feces—each egg develops (figs. 17-27) a minute embryo, which is known as a rhabditiform embryo (fig. 27). This name is given to it because of its resemblance to worms of the genus *Rhabditis*. Characteristic for this stage is the rhabditiform esophagus, which is entirely dif-

ferent from the esophagus of the adult hookworm. This embryonal esophagus is more or less bottle-shaped, and consists of three parts



FIGS. 17-29. Embryology of the Old World hookworm (*Agchylostoma duodenale*) of man; 17-23, segmentation of the egg; 24-26, the embryo; 27, a rhabditiform embryo escaping from its eggshell; 28-29, empty eggshells. Greatly enlarged. (After Perroncito, 1882, p. 342, fig. 142.)

—an anterior elongated swollen portion, followed by a thin middle portion, the latter being followed by a more or less globular esophageal bulb, which possesses a triradite chitinous armature. This kind of esophagus is common to the early stage of all members of the family Strongylidæ and also to numerous other free-living or parasitic nematodes. It is evidently a worm with an esophagus of this sort which was recently found in the earth taken from the New York tunnel excavations, and upon which was based the report that uncinariasis was present.



FIGS. 30-31. Two larvæ of the Old World hookworm at the end of the second stage ("encysted larvæ"), representing the young worms retracted from their skin. (After Perroncito, 1882, p. 350, fig. 148 a-b.)

The embryo of the hookworm lives in water or moist ground. In its evolution the worm casts its skin four times, thus passing through five stages, and changes its structure so as to assume more and more the characters of the adult. During these changes the sexes become differentiated. Some of these changes occur in water or moist ground, and the rest after infection takes place.

DEVELOPMENT OUTSIDE THE BODY.

Segmentation.—The eggs develop best in the unaltered fecal matter, especially when this is well formed; not so well when it is more fluid in character. The addition of water retards the development, and if considerable water is added the eggs perish. Air is necessary to development, and the eggs nearer the surface of the feces segment more rapidly than those in the center. At a temperature of about 27° C. the embryo may form and escape from the shell in twenty-four hours. Lower temperatures retard development, so that at 21° or 22° C. the embryo may not escape for from thirty-six to forty hours; 1° C. kills the eggs in twenty-four to forty-eight hours, so that freezing weather may be looked upon as disinfecting areas exposed to the cold.

Embryo.—Upon escaping from the shell, the embryo (fig. 27) measures 0.3 mm. in length; the anterior end is blunt, the tail long and pointed; six points are visible around the mouth, and these develop later into the papillæ; the buccal cavity is 10 u long, 1.4 u in diameter, and possesses a highly refractive chitinous membrane; the anus is 50 u from the tip of the tail; excretory pore 50 u from anterior end; 160 u from anterior end is seen the primordium of the genital system.

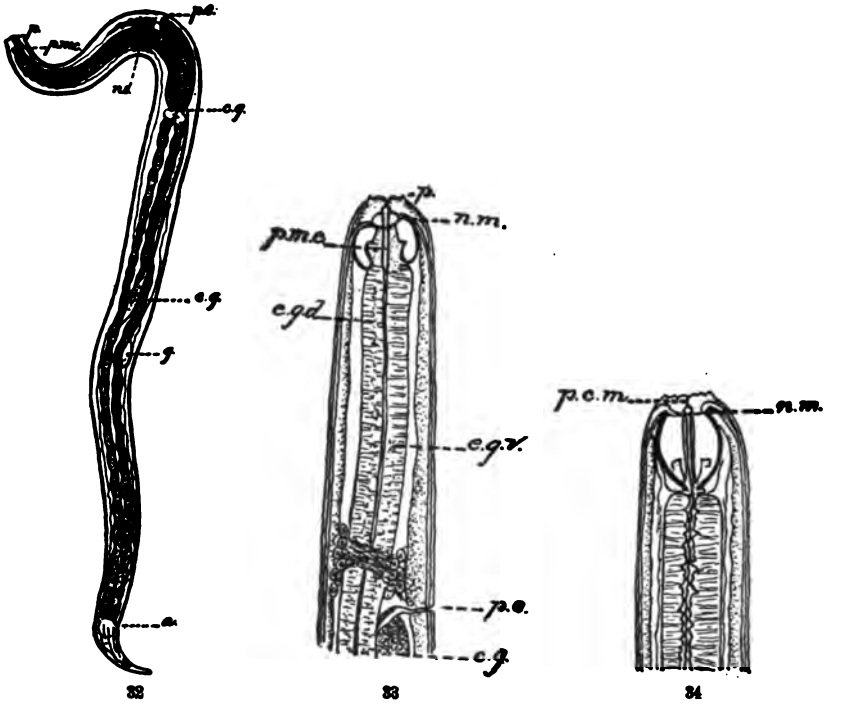


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FIG. 32. A young hookworm (*Agchylostoma duodenale*) of man, without buccal capsule, four days after infection; *a*, anus; *c. g.*, cervical gland; *g*, primordium of genital organs; *n. s.*, nervous system; *p.*, papillæ on head; *p. e.*, excretory pore; *p. m. c.*, primary mouth cavity. × about 190 times. (After Looss, 1897, p. 919, fig. 1.)

FIG. 33. Anterior end of a young hookworm (*Agchylostoma duodenale*) during formation of provisional buccal capsule; *c. g.*, cervical gland; *c. g. d.*, dorsal esophageal gland; *c. g. v.*, ventral esophageal gland; *n. m.*, new mouth; *p.*, papillæ on head; *p. e.*, excretory pore; *p. m. c.*, primary mouth cavity. × 578. (After Looss, 1897, p. 920, fig. 2.)

FIG. 34. Head of larval hookworm (*Agchylostoma duodenale*) before entering fourth stage five or six days after infection; *n. m.*, new mouth; *p. c. m.*, primary mouth cavity, which extends through the provisional buccal capsule and continues as lumen of the esophagus. × 578. (After Looss, 1897, p. 921, fig. 3.)

In this stage the embryo takes food and grows. About the second or third day the embryo casts its first skin, but does not change its organization. After about four or five days (at 27° C.) it measures 480 *u* long by 30 *u* in diameter.

Second Stage.—After the fifth day the young worms begin to show signs of a second ecdysis, at the same time undergoing certain other changes. Three minute lips, each with two very delicate papillæ, appear under the skin at the anterior end; the brightly refringent cuticular lining of the buccal cavity and the chitinous teeth of the esophageal bulb disappear; the esophagus elongates,

becomes thinner, and its three divisions become less distinct; the tail becomes slightly shorter and more blunt; the anus lies 90 *u* from the tip of the tail. The organism becomes more motile, and

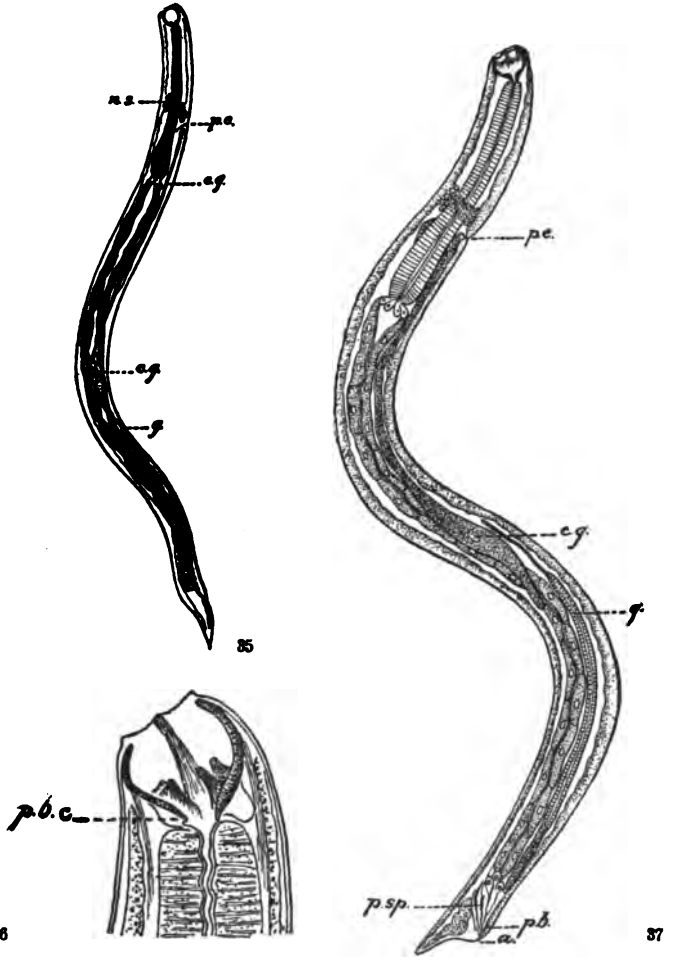


FIG. 35. Young hookworm (*Agchylostoma duodenale*) in fourth stage, with provisional buccal capsule; *c. g.*, cervical gland; *g.*, primordium of genital organs; *n. s.*, nervous system; *p. e.* excretory pore. × 105. (After Looss, 1897, p. 921, fig. 4.)

FIG. 36. Provisional buccal capsule (fourth stage) of a larval hookworm (*Agchylostoma duodenale*), about nine days after infection; *p. b. c.*, primordium of definite buccal capsule. × about 420. (After Looss, 1897, p. 921, fig. 5.)

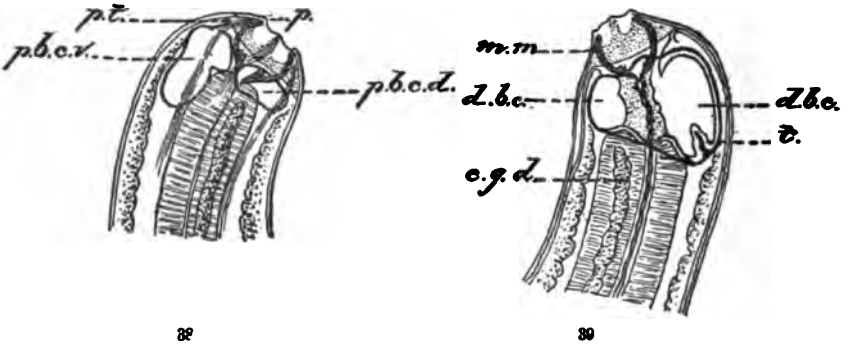
FIG. 37. Young male hookworm (*Agchylostoma duodenale*), nine days after infection; *a.*, anus; *c. g.*, cervical gland; *g.*, genital tract; *p. b.*, primordium of bursa; *p. e.*, excretory canal; *p. sp.*, primordium of spicules. × about 105. (After Looss, 1897, p. 922, fig. 6.)

contracts from its outer skin, thus forming the stage (figs. 30-31) which has been described as an "encystation," but which in reality is simply a second ecdysis. This is the infecting stage of the hookworm, and ends the development so far as the free life is concerned. No more food is taken. In some cases, however, the worm escapes from the surrounding cast skin. While water is more or less injurious to the egg and the first stage, the infecting "encysted" stage exists well in this medium, and Looss (1897) succeeded in keeping these worms alive for thirty days in water. Upon drying up the larvæ die, so that the view that the worms exist in dust and are carried around in the air, thus leading to infection, is not well founded (see p. 373).

DEVELOPMENT INSIDE THE BODY.

Upon being swallowed these young worms undergo further ecdyses, changing their internal organization at the same time. We may recognize, with Looss, a third stage, without buccal capsule (fig. 32); a fourth stage, with a provisional buccal capsule (fig. 35); finally, a fifth stage, with the definite buccal capsule, corresponding to the adult form.

Third State (*without buccal capsule,* fig. 32).—During their free life the larvæ may attain 0.65 to 0.7 mm. in length by 25 to 27 *u* in



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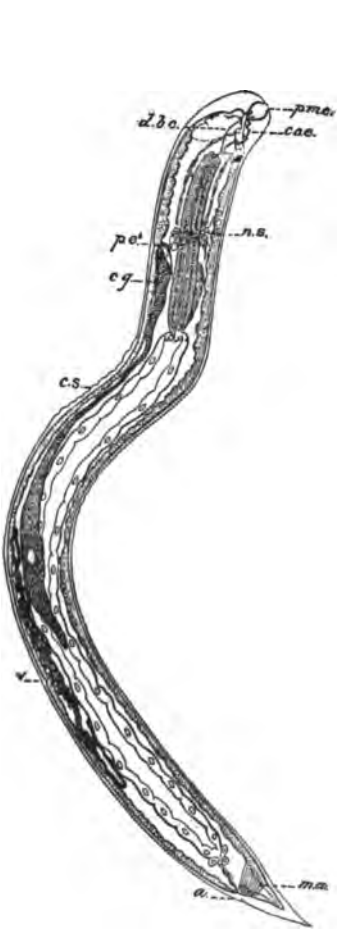
FIGS. 38-39. Development of definite buccal capsule (38, on twelfth day after infection; 39, one or two days later); *d. b. c.*, definite buccal capsule; *e. g. d.*, dorsal esophageal gland; *m. m.*, margin of definite mouth; *p.*, papillæ on head; *p. b. c. d.*, *p. b. c. v.*, dorsal and ventral primordia of the definite buccal capsule; *p. t.*, primordium of the ventral tooth; *t.*, ventral tooth; the new cuticle can be distinguished under the old. × 190. (After Looss, 1897, p. 923, figs. 7-8.)

diameter (at the end of the esophagus). The esophagus is 160 *u* long, and its three divisions may still be distinguished. The intestine is composed of about 15 rows of two cells each.

Fifteen hours after infection of dogs the worms have passed below the stomach. They now begin to feed, but their growth is compara-

tively slow. After about five days they begin to show signs of a third ecdysis, which continues until about the seventh day. During this period important changes take place, especially at the anterior end, and result in the formation of the provisional buccal capsule.

Fourth Stage (*with provisional buccal capsule,* fig. 35).—This is



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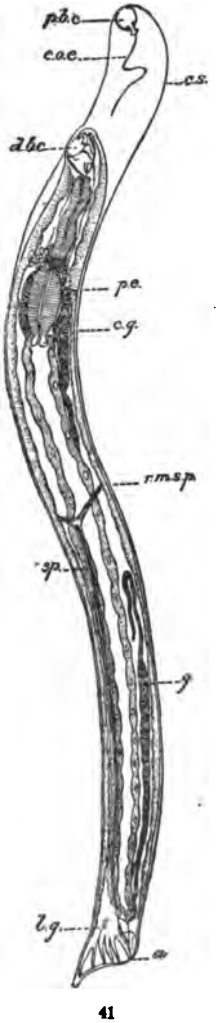

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FIGS. 40-41. Male and female hookworms (*Agchylostoma duodenale*) during the fourth casting of skin 14 to 15 days after infection; *a.*, anus; *c. g.*, cervical gland; *c. o. e.*, cuticle of old esophagus; *c. s.*, cast skin; *d. b. c.*, definite buccal capsule; *g.*, genital organs; *l. g.*, large ganglion, supplying the rays of the bursa; *m. a.*, anal muscle; *n. c. gl.*, nucleus of cervical gland; *p. e.*, excretory pore; *p. b. c.*, provisional buccal capsule; *r. m. sp.*, retractor muscles of spicules; *sp.*, spicules; *v.*, vulva. × 42. (After Looss, 1897, p. 924, figs. 9-10.)

the fourth larval stage, namely, the stage after the third ecdysis. The worms have not increased notably in length, but certain organs are advanced in development, and the esophagus no longer shows its former three divisions. The worms measure about 0.66 mm. long by 25 *u* in diameter, the latter being nearly uniform for a greater part of the length (fig. 35). The provisional buccal capsule attains 40 *u* in diameter, and the mouth is bent slightly dorsal. Two pairs of teeth are visible at the base of the capsule—one pair situated dorsally, the other ventrally. During this stage the animal increases in length and thickness, the inner organs become better developed, the sexes become differentiated, and the definite buccal capsule forms at the anterior end. With these changes the parasite prepares for its last—namely, a fourth—ecdysis, which occurs about fourteen to fifteen days after infection.

Fifth Stage (*with definite buccal capsule*).—The worm is now about 1.9 (male) to 2 mm. (female) long, 12 to 14 *u* in diameter—very much smaller than the adult forms. It is estimated that the parasites require about four to five or six weeks from the time of infection to become mature.

SOURCE OF INFECTION OF UNCINARIASIS.

The worms may be swallowed in contaminated food or in drinking water during or after the second ecdysis. Persons handling dirt are especially apt to get the microscopic worms on their hands, and it is an easy matter to transfer them to the mouth, either directly by biting the finger nails or sucking the fingers, or indirectly with food. In prevention, therefore, careful personal habits and pure drinking water are indicated.

Some writers state that the young stages are scattered in the air by the wind and in a dry state, the inference being that they may then be breathed in or may contaminate food. While not caring to go to the extreme of stating that such a method of dissemination or infection is impossible, my own observations on this class of parasites do not lead me to attach any importance to aerial infection. As a rule, drying-out results in a high mortality among nematode

larvæ, embryos, and eggs, while moisture, on the other hand, is necessary for their existence. Now, uncinariasis is not so common as to fill the air with dried larvæ, and the chances of inhaling the latter appear to be almost infinitesimally small. Since the worms do not increase in number in the intestinal tract, we should, therefore, expect (in case aerial infection were common) to find rather few cases of severe infection, but a more or less uniform light infection of nearly all persons or animals inhabiting an infected area, since all are breathing the same air. Further, as adults breathe more air than children we should expect the former to present the cases of heaviest infection. We should also expect to find the disease more general in dry years than in wet seasons. Such, however, does not appear to be the case. Cases of infection vary greatly in intensity, and the losses from nematode diseases in sheep are much less in dry years and in dry localities than in wet seasons. As a matter of fact, few factors can be conceived of which would probably result in killing more germs of the disease than would dry winds.

In preventing uncinariasis and nematode diseases in general among live stock, systematic draining and burning of pastures are strongly advocated.

Looss (1898, 1901) recently suggested that the larvæ may enter the human body by way of the skin and then pass through the body to the intestine. Startling as this view is, Looss (see Sandwith, 1902) has recently demonstrated the correctness of it. (See p. 393.)

SYMPTOMATOLOGY OF UNCINARIASIS.

In connection with the symptoms, let us recall that uncinariasis is caused by hookworms about half an inch long, which live in the small intestine for several meters below the stomach.

These worms fasten to the mucosa and suck blood. They lay numerous eggs, which can be found by a microscopic examination of the stools. The number of eggs in the feces and, in a general way also, the severity of the symptoms will vary with the number of parasites present and with the duration of the infection.

The injury to the patients results from the following factors: (1) Sucking of blood by the parasites, which is a constant drain on the system; (2) loss of blood into the intestine through the minute wounds made by the parasite, a factor which also tends to deplete the system; (3) the wounds form points of attack for bacteria, hence increase the chances of bacterial infection as well as of toxic infection from partly digested and decomposed food; (4) the wall of the duodenum and jejunum becomes thickened and degenerated, and its function is thus decidedly interfered with; (5) the parasites in all probability produce a poisonous substance which acts upon the patient.

Theoretically there is only one sign which is present in every case, namely, the presence of one or more parasites in the intestine. If these worms are in an egg-laying stage ova will be found in the feces. But from a practical standpoint, severe cases present what seems to be a characteristic type, and even medium cases often present a more or less typical clinical history.

The statement is not infrequently made that there is one way and only one way to diagnose a case of uncinariasis, namely, by examination of the stools to find the parasties or their eggs.

Academically this statement is more or less correct, yet practically it should be somewhat modified. Sandwith (1894, p. 13), to quote from a clinician, states that "facies of the patient is characteristic, though it is difficult to describe his discontented, harassed expression, which sometimes changes to a ready smile after a month's stay in a hospital." The data at my disposal would lead me to divide the cases of hookworm disease I have observed into three general but not very sharply defined classes, namely:

(1) *Light cases,* including those in which practically no distinct symptoms of the disease are noticed, but in which a few hookworm eggs are discovered in the stools. We may also place here a number of cases in which, in addition to the presence of eggs, there is a slight diarrhea or some other slight symptom, including more or less rapid exhaustion after physical exertion, hence an indisposition to work, which is usually interpreted as laziness. Cases of

this class are found in the infected areas and elsewhere, since infected people may move away from the sand districts.

(2) *Medium cases,* including those in which the disease has

FIG. 42. A severe case of hookworm disease observed in Florida. Note the bloated face, the drooping shoulders, the prominent abdomen, and the thin arms and legs. The girl is about fifteen years old. Original, from a kodak photograph.

progressed to such an extent that a more or less anæmic condition is noticed, but other symptoms are not especially marked. If these patients were found outside the infected area, the diagnostician (especially if he is not familiar with the disease) would probably

not see anything particularly characteristic in them; many of these cases, however, show a more or less typical history, and if a history of residence upon sandy soil in tropical or subtropical regions can be obtained, uncinariasis should certainly be strongly suspected. If these cases occur in a family which also presents severe cases of uncinariasis, the diagnosis of hookworm disease in the medium cases is usually quite safe, even if a microscopic examination is not undertaken.

(3) *Severe cases,* in which we find that striking set of symptoms which even the laity in our Southern States attributes to "dirt-eating." These patients present a facies which is well recognized by Southern physicians. If the patient is found in a Southern sand area, the diagnosis is practically certain. If found outside of the infected area, with a history of previous residence in a Southern sand district, its recognition symptomatically ought not to be attended with difficulty. In case of doubt, if a microscope is at hand, the test may be made in less than five minutes; if no microscope is at hand, the blotting paper test (see p. 403) will usually suffice.

Turning now to an analysis of symptoms, I will give my observations on the severe cases. It is needless to state that the symptoms discused may vary in intensity, and that not every symptom mentioned is found in every severe case. We find on the contrary an imperceptible gradation between the severest and the lightest cases.

GENERAL PREDISPOSING FACTORS.—INFECTION OCCURS CHIEFLY ON SANDY SOIL.

In connection with the clinical history, the residence on sandy soil is undoubtedly one of the most important points to be obtained. If an anæmic patient gives no history of temporary or permanent residence on a sandy soil, uncinariasis is not absolutely excluded, but according to my experience the chances are against it. If, on the other hand, a history of sojourn or residence in a sandy rural district is obtained, the probabilities of uncinariasis are decidedly increased.

Nearly every case of the disease found during my recent trip was either living at the time in a sandy district or had lived in such a place a few years previously. As soon as I entered the sandy areas, uncinariasis was found. As soon as I left the sand, as at Albany, local foci of infection of uncinariasis disappeared.

Inquiry among physicians at first failed to elicit any definite statement regarding the soil on which anæmia was most frequent, but upon going farther south several physicians were met whose experience fully confirmed my observations on this point. One physician in particular, Dr. A. M. Burt, of Macon, was of the emphatic opinion that in bringing the condition which I have interpreted as uncinariasis into connection with the sandy soil, I had found the keynote to the distribution of the entire disease. Dr. McHatton, of Macon, called my attention to the fact that in antebellum days the slave owners in the Lower Mississippi Valley frequently provided special quarters, which were removed from the sand districts, and to which they sent the dirt-eating and other sick negroes and also negresses about to be confined, the view being held that a clay soil was more salubrious than a sandy soil. This view, in fact, I found to be rather prevalent among the farm hands. Time after time they remarked, "We were never sick so long as we lived in a clay district," "This disease developed after we moved upon sand," etc.

This view that uncinariasis follows the sand is supported by evidence obtained in Alaska by Mr. F. A. Lucas. After the discovery was made that uncinariasis, caused by *Uncinaria Lucasi,* was prevalent among the seal pups, Lucas showed that it was practically only the seals on the sandy rookeries which were infested with the parasites.

As stated elsewhere, I have also observed two outbreaks of uncinariasis among sheep and goats, caused by *Uncinaria trigonocephala* (Rudolphi, 1809) Railliet, 1900, on more or less sandy soil, and have further confirmatory facts in connection with one outbreak of the disease among dogs. Since returning from my trip I have found at least one reference in literature on uncinariasis

and ground itch to the effect that the soil in districts where certain cases have occurred was more or less sandy (see p. 376), but I have not yet found that any author lays stress upon this point.

In view of all the data at hand, I have no hesitation in expressing the opinion that uncinariasis, caused by *Uncinaria americana*, is pre-eminently a disease of sandy localities and, while infection elsewhere is not excluded, it is my experience that cases found in clay or rocky areas can usually be traced to a former visit or residence in a sandy place.

Just why this disease should follow the sand rather than the clay is not absolutely clear. Three explanations have occurred to me as working hypotheses which, though not absolutely satisfactory as final, will, I believe, explain part of the mystery.

1. We know that uncinariasis is spread through the feces; we know further that when the embryos hatch from the eggs they leave the feces and enter the surrounding water or moist earth, while there is no satisfactory evidence to show that they are blown around in the air in a dry state. (See Stiles, 1902b, p. 199.) Now, assume that a person walks over infected ground; if that ground is clay, he does not disturb the embryos which have crawled beneath the surface, except in wet places; if, on the other hand, the ground is sand, he not only stirs it up while walking, thus bringing the young worms nearer the surface again and thereby increasing their chances of producing an infection, but he is also likely to carry away particles of sand, together with embryos, with him on his shoes or feet, thus increasing his chances of becoming infected. It is further clear that children playing in sand will stir up more embryos than when playing on a clay soil, and will thus increase their chances of infection.

2. An additional explanation is that water will not pass through clay as it will through sand; hence on clay soil the embryos stand a greater chance of perishing or of being washed by rain into the streams. On sand, however, the embryos might perhaps work their

way through the soil* with the water, and thus infect surface wells. In advancing this hypothesis, I am not unmindful of the view, supported by excellent observers, that, since the embryos sink in water, drinking water is not necessarily a common source of infection. Granted that they do sink in water, a water bucket in a well also sinks, and the water from surface wells frequently contains sand particles that are heavier and larger than *Uncinaria* larvæ; hence we can not altogether ignore the drinking water as a possible source of infection. If, on the other hand, drinking water were the only source of infection, it is probable that in families where uncinariasis exists the intensity of the disease would show a greater tendency to uniformity.

Giles has examined fifty-six specimens of water from wells and ponds of villages affected with hookworm disease and sixteen of these he found by chemical and microscopical examination to be "bad" or "very bad." Yet on only one occasion did he find a rhabdite of doubtful origin in water. (Sandwith, 1894, p. 9.)

3. Oxygen is necessary to the development of the embryos and larvæ, and it does not seem unreasonable to assume that sand would on that account present more favorable conditions for the growth to the "encysted" stage, and probably also a longer preservation of that stage.

In this connection it may be noted that Looss has used charcoal as a medium in which to cultivate the larvæ of *Agchylostoma duodenale.*

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*In an article which has just appeared, Looss (1903, p. 331) says:

"Further, during the six years of my residence in Cairo [Egypt], I have not heard, up to the present time, of a single case [of hookworm disease] in an European (my own case, of course, excepted). This fact speaks all the less [so much the less] in favor of the assumption of a more common dissemination [i. e., infection] of the disease through the drinking water, vegetables, etc., since [as] *the mature hookworm larvæ, as experiments have shown, pass through the ordinary sand filter with surprising rapidity, and this even when the water is allowed, not to run off, but to stand.*" [Italics not in the original German.]

INFECTION OCCURS CHIEFLY IN THE RURAL DISTRICTS.

Since the infecting agent of uncinariasis is spread through the feces, we may expect to find infection taking place (other things being equal) in localities where the fecal matter is not properly disposed of. Furthermore, we would not expect that paved streets or grass lawns would favor the development of the disease. We need not, therefore, expect local foci of infection to occur in cities and towns which have proper sewerage system and in which the streets and walks are paved and the yards sodded; but we may expect to find local foci of infection in localities where box privies are used but not properly cared for, or where promiscuous defecation occurs in the woods, fields, mines, etc. This condition is, in fact, exactly what is found. While uncinariasis is not entrely absent from those premises on which the feces are properly disposed of, in cities like Washington, Richmond, Charleston, Macon, Jacksonville and Ocala, such cases as are found can not be shown to have developed there; but probably in most every case they can be either probably or positively shown to have been contracted elsewhere. In a number of cases I have established this point with a probability which for all practical purposes may be looked upon as a certainty. We may, therefore, exclude the greater portion of the inhabitants of sanitary districts of cities from consideration in connection with uncinariasis and may with confidence lay down the general rule that any anæmia developing in them as result of local infection (namely infection at home) is much more likely to be due to malaria or other causes than to uncinariasis.

As we approach the outskirts of cities and towns and enter the rural districts, localities in which box privies are used, but not always properly cared for, we meet with conditions which are more favorable to infection with the hookworm disease. Accordingly, in cases of anæmia, especially in women and children, developing in such localities, uncinariasis must be taken into consideration as one of the possible causes.

Sandwith (1894) states that his patients came from all parts of Egypt except some of the seaport towns.

As we go into the country and visit the farms we not infrequently find a condition, in respect to the disposal of fecal discharge, which almost beggars description. Taking the rural districts visited during my recent trip as example, it is not an exaggeration to say that with the exception of the planters' premises, not over half of the country houses or huts of the sand regions have any privy at all; if there is one present, it is rarely properly cared for; furthermore, it is the exception rather than the rule that it is used. As a result uncinariasis is widespread, not because the country air is particularly favorable to its development, but simply because so little attention is paid to the proper disposal of the fecal discharges.

SYMPTOMS ARE MORE SEVERE IN SUMMER THAN IN WINTER.

It is almost universally conceded that the patients are in better condition in winter than in summer. According to testimony, the symptoms begin to increase in the spring and to decrease in the early winter. This periodicity will be noticed, of course, only in localities which are above the frost line, and it is easily explained when we take into consideration the biology of the parasites. Cold retards and heat hastens the development of the eggs and the embryos; a freezing temperature of twenty-four to forty-eight hours duration, it is said, kills both eggs and embryos. Accordingly, after frost sets in in the fall, the patients will add less to the infection which is present in their bowels than they will during the summer. Some of the worms already in the intestine will be passed, thus decreasing the number of parasites present; the patient will accordingly lose less blood and will on this account feel somewhat better. As warm weather begins in the spring the free eggs and embryos will develop more rapidly and the infection will be increased. There will be more parasites in the intestine, hence symptoms will be augmented.

Some few patients, however, insist that they are better in summer than in winter.

It is probable that the seasonal periodicity of the symptoms

noticed in our Southern States will be modified in the Tropics, so that the symptoms will increase in severity in the rainy season and decrease in the dry period of the year. Such a periodicity would correspond to the biologic fact that the eggs and embryos perish very quickly upon becoming dry.

In patients who are not subject to continued infection, as for instance those who have left the area of infection, the seasonal periodicity may be expected to disappear.

WHITES APPEAR TO BE MORE SEVERELY AFFECTED THAN NEGROES.

Osler and other observers have already noticed that chlorosis is more frequent in blondes than in brunettes.

Uncinariasis occurs in both blondes and brunettes, and in both the white and the negro, but so far as my observations go the disease is more severe, *or at least more noticeable,* in blondes than in brunettes, and much more severe, as a rule, in the white than in the negro. This observation was supported by all the evidence I could gather from local physicians. In fact, several practitioners declared that they had never seen a case in the negro to recognize it. There is, however, abundant evidence that such cases do occur.

I am at a loss for a satisfactory explanation of the comparative freedom from uncinariasis noticed in the negro. They live under the same conditions as the poorer classes of the white population, except that, as a rule, the negro farm labor is more common in the rich than in the sand districts; however, negroes also live in infected districts. It is true, as frequently claimed, that some of the negro habitations are more clean than some of the homes of the poorer whites. Still, not all negro huts are cleaner than all white huts. The personal habits of the negro children are certainly no more hygienic than those of the white boys and girls.

One factor which may possibly play a rôle in this comparative freedom from the disease on the part of the negro is the fact that negro women very frequently give their children "worm tea," made from certain plants, in order to expel the "eelworm" (*Ascaris lumbricoides*), or they give calomel "to regulate the liver," and

this may perhaps also result in expelling the hookworms before the latter have had an opportunity to do much harm. Still this explanation is not altogether satisfactory, especially in view of the testimony of both the local physicians and the negroes themselves to the effect that eelworms are much less common now than formerly, hence "worm tea" is not taken so frequently as in former years.

Chabert (1821a), Jordan (1832), Imray (1843), Le Conte (1845), Duncan (1850), and other authors report "dirt-eating" among the negroes. In fact, nearly all early authors who describe "dirt-eating" lay special stress on the frequency of the habit among the slaves.

In conversation with a negro druggist, I was informed that while dirt-eating was formerly said to be more or less prevalent among the negroes, it was an acknowledged fact among them that the custom had greatly decreased in recent years. In connection with this statement we may note the interesting claim by Cotting (1836a) that there was a reduction in dropsy and dirt-eating corresponding to the more general use of calomel.

Sandwith remarks upon the apparent comparative freedom of the negro from uncinariasis and anæmia. Zinn and Jacoby (1896) also refer to the frequent presence of *Agchylostoma duodenale* in negroes of Africa, in whom the anæmia was not prominent.

Can it be that the poison produced by the hookworms has less effect upon negroes than on whites and that on this account the disease is less severe in the dark races?

OCCUPATION OF PATIENT.

It is generally acknowledged by writers on uncinariasis that the disease is especially prevalent among people who in their daily work come in contact with earth. In fact, the malady is sometimes called "brickmakers' anæmia" or "miners' anæmia." Sandwith mentions "peasants" as apparently forming the majority of his patients.

In my own work I was surprised to find that hookworm disease was comparatively light and comparatively rare among the miners

I examined. Of brickmakers my statistics are too small to permit any generalization. Two examinations out of eight showed light infections. Most of my cases were from the farming classes.

Sandwith emphasizes the fact that his patients came from the poorest class of the community, and that of 200 men 190 were accustomed to work with their hands in more or less damp earth. Of these 190 men, 152 were agricultural laborers; 18 were masons or bricklayers' laborers; 7 were "scavengers of street refuse and of cesspools, accustomed to emptying with their hands the dry contents of the latter;" 7 were peddlers of unwashed vegetables; 3 limestone carters and scavengers; 1 gardener; 1 fisherman in the mud; 1 "shadouf" worker at the Nile bank; 1 coffee-stall keeper; 3 readers of the Koran; 1 blacksmith; 1 shoeblack; 4 beggars. Sandwith also mentions twenty cases among policemen, who dated their illness from periods of life when working as agricultural laborers.

SEVERE CASES ARE MORE COMMON IN WOMEN AND CHILDREN THAN IN MEN OVER TWENTY-FIVE YEARS OF AGE.

The assertion is frequently made that uncinariasis is more common in men than in women and children. This statement may be perfectly correct in mines and brickyards, but it does not hold good for the farming localities I visited, where the greater prevalence of severe cases in children than in adults, and in women and children than in men over twenty-five years of age, is very striking. The conditions found, in respect to this point, seem to be due to four factors in particular, namely: (1) The average family in the country districts numbers from, say, six to twelve. As a rule, two or three of these can be called adults, and three to nine can usually be classed as children (including minor boys and girls). Since there is a greater number of children than adults subject to infection, we should naturally expect to find a greater number of cases among the children, and our expectations are fully realized. (2) The fact that children and women present a greater number of cases than do the adult males over twenty-five years of age, I am

inclined also to explain on the ground that the former are at home more than are the men; the area immediately surrounding the house, for, say, a radius of fifty meters, is a more common place for defecation than are the more distant fields, hence it is more severely infested with the infecting agent. Now, while it is true that, among certain classes, both women and children work in the fields, it is also true that they do this much less than the men. They are at home more, therefore they are on the more intensely infected area for a greater length of time; hence, in respect to actual time they are more subject to infection thas are the men, and, other things being equal, they will present a greater number and a greater proportion of extreme cases. (3) The children in playing in the sand around the house, and owing to their more careless personal habits, are, of course, especially liable to infection. (4) The men being stronger, are, as a rule, better able to withstand the effects of infection. An interesting and important fact is that men of about twenty to twenty-four seem in many cases to more or less outgrow the effects of the malady. They give a history of medium or severe infection from, say, ten to eighteen years of age, then at eighteen or twenty they begin to improve, and finally appear much better, although their features and physique still show the effects of former disease. This time of improvement corresponds to the years following their first more active participation in work which takes them more away from the house, hence to years when they are subjected less constantly to infection.

Sandwith states that nearly all of his 402 patients were in the prime of life, between 20 and 40 years of age. His youngest case was a boy of 6 years; 48 patients were between 10 and 20 years of age; 170 patients were between 20 and 30 years of age; 140 were between 30 and 40 years of age; 21 were between 40 and 50; 15 were between 50 and 60; and 7 were above 60.

Giles reports a case of a girl 4 years of age. My youngest patient was 3 years old.

Of Sandwith's 402 cases only three were females. This statement is in striking contrast to my observations. Sandwith and I

made our studies, however, under totally different conditions, for his patients came to his hospital, while I went to the homes of the infected persons. Possibly this will explain, in part, our different results, for he states that "women have not yet learned to apply for hospital relief in the same proportion as the men."

SEVERAL CASES ARE LIKELY TO OCCUR IN THE SAME FAMILY.

Uncinariasis commonly occurs in groups of cases. If one child in a family is accused of being a "dirt-eater," and is shown by physical and microscopic examination to represent an extreme case of uncinariasis, an examination of the remaining members of the family will usually show that most or all of them are suffering from anæmia in different degrees, and the microscope will disclose infections with *Uncinaria*. This condition of affairs is so general that it may be looked upon as the rule among farming classes, while the occurrence of isolated cases in a family, except possibly among miners, may be looked upon as an exception. Numerous observations could be cited in support of this view; for instance, in the first family examined in the sand district near Haile Goldmine only one member had the reputation of being a "dirt-eater," but all eleven were in different stages of anæmia. In a family of ten members on a neighboring plantation only one was noted as a resin-chewer, but all ten were anæmic. In orphan asylums it was noticed that if two or more children of one family were present and one child was affected, the other children were also affected. In fact, in every instance where I was able to examine the family to which an alleged "dirt-eater" or "resin-chewer" belonged, all or nearly all of the members of the family showed an anæmia with the general history of uncinariasis, and in every case examined microscopically the eggs were found.

Two families may, however, live very close together, and one family may show several severe cases while the other may not show a single case severe enough to be suspected symptomatically. Thus, on one plantation all the hands examined showed uncinariasis, while the planter's family, of much more cleanly personal habits,

did not exhibit any signs of infection. It is, however, more common to find that where one family is affected other families of the same neighborhood will show infection, provided, of course, that the infected family in question has not moved into a city or a clay district.

The occurrence of cases of uncinariasis of different degrees of intensity in family or neighborhood groups is easily explained by the fact that in a given family or neighborhood all persons are subject to the same general conditions of infection, but owing to differences in age, daily occupation, personal habits, etc., some will be more subject to infection than others.

OBJECTIVE AND SUBJECTIVE SYMPTOMS; ANALYSIS OF SYMPTOMS.

It is difficult to draw a distinct line between the subjective and the objective symptoms. If a patient is left to tell his own story, practically all that the observer will learn is that the patient "feels weak, has a headache, gets dizzy, has fluttering of the heart, finds it hard to breathe, feels worse in summer than in winter, and has 'misery' in the 'stomach.'" In medium cases a few judicious questions, directed more to the parents than to the patient, will, as a rule, bring to light a history upon which, taken in connection with what one can himself observe, a probable diagnosis may be made. As a rule, little weight can be placed upon the statements made by a patient suffering from a severe infection in uncinariasis. He will answer "yes" or "no" in a most contradictory manner, so that by putting questions in different ways it is practically possible to make him admit or deny, as desired, any particular symptom. It is chiefly from the patient's family that one must judge of what the person has complained.

ONSET AND INCUBATION.

As it takes the parasites four to six weeks to reach maturity after entering the system, the earlier symptoms will be more particularly gastro-intestinal (see, however, p. 374), and even if these are present in a marked degree we can not look for a diagnosis by

microscopic examination of the feces until the worms begin to lay eggs. It is, however, not excluded that some of the young worms might be passed in the stools and be identified, though such a chance is probably more theoretical than practical. In an experimental case of infection through the skin, Looss showed that eggs did not appear in the feces until seventy-one days after infection. According to Sandwith (1894, p. 12), Surgeon-Major Giles suspected that many of his patients in Assam had suffered from fever at the onset of their malady, and he was confirmed in this impression by observing pyrexia in the monkeys fed on hookworm ebroyos.

Looss (1897, pp. 914-915) noticed nausea as the first symptom in dogs to which he fed the larvæ of *Agchylostoma duodenale.*

Bentley (1902a) practically advances the view that "ground itch" is the primary symptom, and since Looss's view of infection through the skin is correct, at least for some cases, some cutaneous symptom must in such instances be the first symptom of uncinariasis. (See p. 393.)

STAGES OF UNCINARIASIS.

Since my observations of each patient were confined to one or two days, they would not justify me in dividing the disease into stages. Lutz, 1885 (translated by Macdonald), recognized the following stages:

I. Stage of Purely Local Symptoms.

(a) *Acute Form;* (b) *Chronic Form.*—The symptoms are similar in both forms. The disease is yet limited to pains and disordered digestion; no pallor, no rise of pulse.

II. Stage of Simple Anæmia or Oligocythemia (Chlorotic Stage).

(a) *Acute Form.*—1. Slight degree: Conjunctival vessels still visible; nails and lips pale red; pulse increased in frequency; no blowing murmurs over cardiac area.

2. Higher degree: Conjunctivæ devoid of vessels; nails whitish; lips pale; pulse frequently very much increased; no blowing murmurs.

(b) *Chronic Form.*—Anæmia has not reached the highest degree. In many cases distinct cardiac hypertrophy and dilatation; in other cases disordered valve closure; seldom both combined. Moderate increase of frequency of pulse.

III. Dropsical Stage.

(a) *Acute Form.*—A high degree of anæmia; pulse small, much increased in frequency; no blowing murmurs; edema of a hydremic character.

(b) *Chronic Form.*—Symptoms of cardiac defects, with disturbed compensation, or of fatty degeneration; distinct symptoms of cyanosis; dropsy of engorgement; anæmia of varying intensity; disordered nutrition.

DURATION OF UNCINARIASIS.

In speaking of the duration of uncinariasis, we should clearly distinguish between the duration of cases which remain in the infected areas, and the duration of cases which after once becoming infected move to uninfested districts where conditions are such that reinfection is excluded.

In the former instance we have to deal with cumulative infection, taking place week after week and year after year, hence successive generations of parasites come into consideration.

In the latter instance we have to deal with the individual life of the parasites which are present in the patient at the time he leaves the infested area.

A failure on the part of most observers to distinguish between these two classes of cases renders the published data less valuable than they otherwise would be in determining the duration of uncinariasis.

In my own observations, I have found people remaining in the infested areas who gave a history of the disease extending back for ten, twelve, and even fifteen years. I have further three observations which I consider free from criticism in connection with patients who presented the disease six years (two cases) and even

six years and seven months (one case) after being removed from the source of infection. I also have one observation, which is not free from criticism, upon a patient who showed the disease ten years after entering a hospital.

Sandwith (1894, p. 15), in discussing the duration of illness, says:

"Nearly every patient said he had been ill two or three years before admission. I find among my notes twenty-nine cases, uncomplicated by other diseases, where the patients said they had suffered more than three years. Of these, thirteen had been ill for four years, six for five years, three for six years, two for eight years, two for nine years, two for eleven years, and one vowed it was fifteen years since the commencement of his symptoms.

"It may be safely said that during these long intervals of time very few patients had any rational treatment."

It is probable that Sandwith's cases were subject to cumulative infections.

LENGTH OF LIFE OF THE INDIVIDUAL PARASITES.

It is already established that for every hookworm which is present in the intestine a separate embryo must enter the body. In other words, the eggs which the female worm deposits in the intestine will not develop there to mature parasites, but must first be discharged in the feces and undergo certain changes.

It is further clear that direct autoinfection, such as takes place in the case of pinworms (*Oxyuris vermicularis*), is excluded. For instance, suppose a child is at stool and soils his fingers with the feces, which contain hookworm eggs, then puts his fingers into his mouth and swallows the eggs; these ova will not develop in the bowels into adult worms.

Whether an *Uncinaria* egg, which happened to get under the finger nails, could reach the larval infecting stage in that place is perhaps an open question. So far as I am aware, the point has never been studied, but what is already known about this group of parasites does not lead me to believe that such a condition would be

especially common, although it does not seem absolutely impossible.

With the foregoing premises in mind, it is important to determine how long the parasite in the intestine can live. Regarding the American hookworm, *Uncinaria americana,* I can present the following data: Of children at the Charleston Orphan Asylum in whom I demonstrated the presence of *Uncinaria americana* microscopically, it may be noted that eight children had been in the orphan asylum two years or less; four children had been in the asylum between two and three years; two children had been in the asylum six years; one child had been in the asylum six years and seven months.

I have selected the Charleston Orphan Asylum as best fulfilling the conditions desired to illustrate the point at issue. The refined discipline, the scrupulous cleanliness, and the general hygienic conditions noticed are such that local infection is practically excluded. It must be admitted that some persons coming in from the country might possibly bring on their shoes a few embryos, but such a theoretical possibility is altogether too remote to explain the fifteen cases found.

For all practical purposes we are justified in assuming that the hookworms which these fifteen cases had in them when I saw them were the same individual worms which were in the children when the latter entered the asylum, and from the data obtained it is clear that hookworms of the species *Uncinaria americana* are capable of living six years and even six years and seven months.

A sixteenth child (case of L. B.) examined showed a clear clinical history of uncinariasis of long standing. Her condition at the time of entering the institution, as described to me by Dr. Huger, and her present complexion, eyes, stunted growth, and inferior mental development leave no practical doubt in my mind regarding the diagnosis. No normal eggs were found in her stools, despite the fact that I made twenty-five slides. One slide showed a single abnormal egg which had evidently been dried and had clung to the slide after an examination in some other town. I do not know

this girl's complete therapeutic history during the past twelve years, but from the absence of eggs in her stools it is necessary to conclude either that the worms had been expelled by the drugs taken or else *Uncinaria americana* is not able to live twelve years.

Ashford (see Stiles, 1902b, p. 210) mentions a case where a boy "had been the host of the worm for probably ten or fifteen years," but he does not state that during this time the patient was not exposed to further infection.

The clinical importance of the length of the life of the parasite is self-evident. Suppose a physician in the North has an anæmic patient, or a physician in the South has an anæmic patient who lives in the city or in a clay district; it is not sufficient to inquire whether he or she has recently been exposed to malaria, but inquiry should extend for eight or more years back in order to develop the fact whether she has during this time visited any tropical or subtropical sand area. If such a fact does develop, uncinariasis is among the probabilities and a microscopic examination of the feces should be made.

GENERAL EXTERNAL APPEARANCE.—GENERAL LACK OF DEVELOPMENT —STUNTED GROWTH.

In severe cases of long standing the patient is undeveloped both physically and mentally. A boy or girl 12 to 14 years old may be as small as the average child of 6 or 8; a young man or woman of 18 to 22 years old may present the general development of a child 12 to 16 years of age, but the face may appear either like that of a child or like that of a very old person, especially like that of an elderly dwarf. Similar conditions have been described as a symptom of dirt-eating.

SKIN.

The skin has an anæmic, waxy white to a yellow or tan, shriveled, parchment-like or tallow appearance. In general it is that color known in the South as a "Florida complexion." In some cases of malaria, if one trusts too much to the appearance of the skin, he is likely to be misled into an erroneous diagnosis of uncinariasis, but

the general clinical history is usually sufficient to distinguish between the two diseases, while the microscopic examination gives a positive diagnosis. (See also Temperature, p. 407.)

Wounds Heal Slowly.—Among the first severe cases of uncinariasis found, I noticed that several of the patients wore bandages. Suspecting the possibility of ground itch and recalling Looss's and Bentley's theories (see below), I immediately inquired into the history of the sores. According to the testimony of the patients the ulcers present had started as small wounds produced mechanically; the wounds had failed to heal promptly, had grown worse, and were now about a year old. This same story was related to me by quite a number of patients, and many other persons suffering from uncinariasis assured me that in their cases cuts and bruises healed very slowly, testimony which was repeatedly corroborated by local physicians.

Cutaneous Lesions Caused by Uncinariasis.—The statements just made lead to a consideration of certain views recently advanced by Looss and Bentley.

Looss's Theory of Cutaneous Infection.—Looss (1901) has shown that if a drop of water containing embryos of *Agchylostoma duodenale* is placed upon the skin an itching sensation is produced; the worms enter the hair follicles, and from there they seem to bore into the surrounding tissues. Looss further advanced the rather startling opinion that the larvæ then reached the intestine, and he recounted observations which gave a certain amount of plausibility to this view. More recently (see Sandwith, 1902), Looss has performed experiments which, so far as can be judged at present, demonstrate the correctness of his theory. According to Sandwith (1902), Looss* smeared on the back of a puppy a mixture of charcoal and feces in which hookworm larvæ had been bred. Between nine and ten days afterward the puppy died and was found to have

*Looss's (1903) article, detailing his brilliant experiments, has recently appeared. He demonstrates, beyond any question of a doubt, the correctness of his contention that infection with hookworms may take place through the skin.

anæmia of most of his organs, and a plentiful supply of young hookworms was found in his jejunum. A second puppy was treated in a similar way and also died on the night between the ninth and tenth days. Upon post-mortem he also showed exactly the same results. A man who offered himself for experiment was also similarly treated on his forearm, and in his case the first hookworm eggs were discovered in his feces on the seventy-first day. In all three experiments the feces were regularly examined for some weeks prior to the experiments, so that, so far as we can now judge, the results must be accepted, despite their very startling nature. Furthermore, Looss is known as too careful an investigator to permit any foreseen error to creep into his conclusion.

Somewhat similar results, namely the entrance of embryos into the skin, have been obtained by Van Durme (1902, pp. 471-474) in experiments with *Strongyloides stercoralis* on guinea pigs, and it is needless to insist on the great importance of Looss's demonstration.

Bentley's Theory of Ground Itch.—In line with Looss's views, Bentley (1902a) has made certain exceedingly important observations and experiments, the logical conclusion of which, taken in connection with Looss's work, seems to be that at least certain forms of ground itch constitute the initial symptom of uncinariasis. Bentley defines ground itch as follows:

Ground Itch—Synonyms: Panighao, Water Itch, Water Pox, Water Sores, Sore Feet of Coolies—is an affection of the skin, confined entirely to the lower extremities, and probably always associated with the presence of the larvæ of *Ankylostoma duodenale* in the soil of the affected areas; endemic in Assam and the West Indies and possibly present in other parts of the Tropics; characterized by its periodical epidemic appearance in the infected areas, coincident with the onset of the rainy season; with typical lesions consisting in a primary erythema, followed by vesicular eruption, which frequently becomes pustular and in severe cases may result in obstinate ulceration, or even gangrene.

Dr. Seheult (1900), of Trinidad, has suggested that the disease is probably due to some chemical irritant present in the soil, either

natural or due to manure used in cultivation. Dr. Dalgetty (1901), of South Sylhet, struck by the resemblance which the lesions bear to scabies, and finding a mite present which he named *Rhizoglyphus parasiticus*, assumed this acarine to be the cause. These authors and Bentley (1902a) seem to agree that ground itch is a filth disease which is increased by the lack of care given to the proper disposal of alvine discharges.

Bentley (1902a) found in a water sore a young worm which he considered to be identical with *Agchylostoma duodenale*. He then performed the following experiments:

a. Some ordinary soil was sterilized by heat, and after being moistened with sterilized water, was infected with a small quantity of fecal matter containing numerous ova of *Agchylostoma duodenale*.

b. A similar preparation of soil was infected with a small quantity of feces, which on examination was found to be free from hookworm infection.

These two preparations were incubated at the ordinary temperature of the air for about a week, when sample "*a*" was found to be swarming with larval hookworms and various forms of bacteria and fungi, and sample "*b*" was similar in appearance except that no hookworm larvæ were found.

Each sample was then divided into two parts, *a'* and *a''* and *b'* and *b''*. Samples *a'* and *b'* were kept moist, while *a''* and *b''* were gently dried by exposure to the air for eight hours. Previous experiments had shown that six hours gentle drying at ordinary temperatures was sufficient to kill the hookworm larvæ. After remoistening *a''* and *b''* with sterilized water, the four samples were applied to the wrists of the subjects of experiment for eight to nine hours, and then they were removed. Fifteen hours after the first application, considerable erythema with a minute papular eruption appeared over the spot to which *a'* had been applied; within twenty-four hours a distinctly vesicular eruption had developed, followed by pustules exactly resembling those found in the lesions of ground itch. In the other cases a faint reddening of the skin was produced, which shortly afterwards disappeared. A re-exam-

ination of sample *a'* now showed that no live larvæ were present, although one or two dead worms were found. Sample *a"* still contained the dead larvæ. Apparently, therefore, the live larvæ *a'* had entered the skin and their entry had been followed by lesions similar to those found in water sore.

According to Bentley, also, it is probable that the acuteness of the inflammation attending an attack of the ground itch is largely governed by the nature of the organisms which accompany or follow the larval hookworms in their passage through the skin.

Regarding the treatment of ground itch, Bentley says that in the papular and early vesicular stage of the disease the application of a strong solution of salicylic acid in collodion or methylated spirit will cause the eruption to dry up, and so cut short the attack of the disease to one or two days. If, however, put has formed, the only treatment of any service is the opening up and disinfection of the pustules with pure carbolic acid, silver nitrate, or nitric acid, and the after treatment of the sore as an ordinary ulcer. In cases attended with great swelling, inflammation, and tendency toward the formation of sloughs, free skin incisions and the use of hot antiseptic footbaths are indicated.

Dalgetty (1901, p. 77) advises the application of a strong solution of lime and sulphur; strong phenyl solution is also beneficial, and a coating of coal-tar acts for a time as a preventative against infection; but when once the vesicles have formed pustules are sure to follow, and then the only remedy is to open them, evacuate the pus, and thoroughly cleanse them.

An anonymous writer (? Dr. Elliot, of Assam) in the *Journal of Tropical Medicine* (1900), gives the following directions:

"The indications are to get the case as soon as possible; to carefully cleanse the foot by soaking it in warm antiseptic solution; then open the vesicles with sharp pointed scissors, snip the loose skin away, and finally wash the parts with carbolic acid solution (1 in 40), and treat the resulting ulcer with carbolic acid, phenyle oil, extract of paroli leaf, zinc ointment, etc., according to circumstances. The soaking, washing, and dressing operations are

repeated once or twice daily, and healing takes place in eight or nine days in favorable cases."

It will be noticed that Bentley does not definitely state that he adopts Looss's view of intestinal infection through the skin; nor does he definitely state that the hookworm larvæ act as anything more than carriers of bacteria. The conclusion would therefore seem to be that the ground itch with which he was dealing is a bacterial infection due very probably to fecal bacteria.* If this interpretation is correct, its *dependency* upon uncinariasis does not seem to be proved, although its occurrence with the disease would seem to be established.

Additional facts (besides Bentley's experiments) which support the view that the ground itch, with which he was dealing, is more or less connected with hookworm infection are the following:

Ground itch occurs in the warm rainy season, especially in June, July, August and September, and does not occur in cold weather, even when it rains; thus the seasonal distribution in general agrees with the infection period of uncinariasis. Grass-covered soil and smooth beaten roads do not cause it, neither does working in loose dry soil; and these conditions are unfavorable to the development of uncinariasis. The number of cases increases after a heavy rain and rapidly decreases during a hot spell, a fact which agrees with the biology of hookworms. "The soil itself is sandy, with clay here and there; a belt of pure sand, forty to sixty feet thick, lies at a depth of six to eighteen feet from the surface;" and uncinariasis is pre-eminently a sand disease.

Hair.—The hair on the head appears to be about normal, but in cases contracted before puberty, the beard and the hair on the body (pubis, armpits, arms, legs) are usually undeveloped. I have seen patients twenty years of age upon whose body hairs were almost absolutely lacking.

Breasts.—The breasts of females, who have contracted hookworm disease before puberty, remain more or less undeveloped. In a girl

*Looss has, however, proved that certain cutaneous symptoms follow the entrance of hookworm larvæ into the skin.

of twenty years of age, for instance, the breasts may not be developed beyond those of a girl of eight or nine years old.

Nails.—The color of the tissue directly under the nails varies with the anæmia.

HEAD.

Face.—The face has an anxious, stupid expression, and in severe cases is more or less "bloated" (edematous).

In fact, a prominent symptom of uncinariasis in practically all animals in which it occurs is the development, in severe cases, of a more or less extreme edema. To use the rural vernacular, "the face bloats," and "the feet and ankles swell." The symptom in question is more or less irregular in man as it is in other animals, notably in sheep, appearing and disappearing at intervals. Upon several occasions I was informed that this symptom interfered seriously with the school attendance, for if the children sat still a long time in school "they began to swell." Quite generally, as was to be expected, testimony was to the effect that the edema was less frequent in the winter than in the summer.

Eyelids; Conjunctivæ.—An examination of the eyelids exhibits the visibility of the blood-vessels in light cases, but an absolute marble whiteness in very severe cases, with all possible intermediate stages corresponding to the general degree of anæmia.

Eyes.—While looking at the eyelids for anæmia, the observer frequently notices that the pupils are dilated or that they dilate readily and that the eyes are dull, dry and usually of a chalky white. If the patient is directed to stare intently into the observer's eyes, there will be noticed a symptom which it is difficult to describe, but which I have found more constant than almost any other noticed, namely: After a moment, the length of time *apparently* varying slightly according to the degree of the disease, the pupils dilate and the patient's eyes assume a dull, blank, almost stupid, fish-like or cadaveric stare, very similar to that noticed in cases of extreme alcoholic intoxication. I am not familiar enough with the stare of anæmic patients in general to state how common this peculiar look is among them, nor have I found any of my medical

friends who could give me much information on this subject; but I can state that among the several scores of anæmic people whom I examined on this trip, in the severe cases, with two exceptions, I found the eggs of *Uncinaria americana* in every one (whose feces were examined) in whom I observed that indescribable stare; the two exceptions in question were city boys, both of them sons of a confirmed inebriate; further I failed to find the eggs present in certain extremely anæmic patients in whom the stare was not noticed. It certainly was absolutely absent from a number of typical cases of malaria. Toward the end of the trip, I found myself unconsciously relying more upon the presence or absence of the blank stare than upon any other single symptom, except, of course, the presence of the eggs in the stools.

I will not go to the extent of stating that this stare is diagnostic for uncinariasis (and I will even warn that in dark eyes it is less evident than in eyes of light color), for I do not feel that I have had experience enough with the peculiarities of eyes in various diseases to speak authoritatively upon the subject. I simply mention this peculiarity in connection with the discussion of the eye as a symptom which, as my investigations progressed, made more and more of an impression upon me. Upon calling the attention of several local physicians to this peculiar stare, they informed me that it was a totally new symptom to them, but that after examining several cases they found it a very prominent symptom. As a general rule the eyes in advanced stages are dry. In this connection it may be noticed that several authors have mentioned the glassy appearance of the eyes of dirt-eaters.

Since my return, several of my clinical friends with whom I have discussed this symptom have expressed some skepticism in regard to the matter. Although thoroughly convinced of its existence, for I saw it too frequently to be deceived, I have written to several Southern clinicians requesting them to give me the benefit of their independent observations on this point, and the following replies have been received:

[*Extract from a letter from Dr. Hilsman, January 2, 1903.*]

"Replying to your letter, 24th ultimo, I have to say that I have

examined the patients that we saw in the country, and on making them gaze intently at me as you directed, I observed the vacant stare that you described, but did not observe the dilation of the pupils. The stare is very much like that of an epileptic as he begins to recover from a fit.

"These cases have improved under treatment suggested by you. The little girl passed a large number of the worms."

[*Extract from a letter from Dr. M. A. Clark, January 30, 1903.*]

"I have delayed, hoping to find the eye symptom you mention, but I have not yet found it. My cases are improving slowly."

Dr. James Edward Stubbert, of New York, who spent some years in Central America and has seen many cases of hookworm disease, has stated to me that he has frequently observed the peculiar stare in the eyes of dirt-eaters. With Dr. Harrison, of Talladega, Ala., I have recently confirmed the existence of this peculiar eye symptom.

In this connection, it is also not uninteresting to note that some "worm doctors" claim to lay special stress upon the eye in making their diagnosis; also that dilation of the pupil, due to irritation by intestinal worms as well as to anæmic conditions, is recognized by certain prominent writers on the eye; further, that dilation of the pupil is also a symptom upon which many children's nurses depend in suspecting the presence of worms.

Sandwith (1894, p. 12) states that the eyes of his patients showed a pearly white conjunctiva, singularly in contrast with the yellow color of the face. Dr. Scott examined several men for him with the ophthalmoscope, and found in half of them a normal fundus, and in the other half a very pallid fundus. The refraction tests showed astigmatism in many cases.

Nostrils.—The visible mucous membrane of the nostrils becomes pale in proportion to the anæmia.

Lips and Gums.—The lips also become pale in proportion to the anæmia, the inner surface of the lips and the outer surface of the gums frequently presenting almost a chalky white appearance.

Teeth.—Irregularity of the teeth was so common among patients

affected with uncinariasis that the question arose in my mind whether this was not to some extent an expression of the general underdevelopment of the body due to this disease. The point at issue calls for the opinion of a dentist rather than that of a zoologist. The decayed teeth of dirt-eaters have been recorded in early writings on this habit.

Tongue.—In some cases the tongue was coated. A number of observers have already called attention to this symptom, which was by no means general in the cases I observed.

Several authors have remarked upon the presence of black, brown or purple spots on the tongue in cases of uncinariasis, and the view has been advanced that these present a valuable aid in diagnosis, and in some cases, at least, that they disappear on treatment. In the cases which came under my observation, I looked very carefully for this symptom. In many instances I found more or less distinct purplish to brownish spots, irregularly round or elongate in shape, and these may or may not be identical with the spots described by the authors cited. It was, however, noticeable that in many cases where these spots were observed, the patients were accustomed either to chewing tobacco or to dipping snuff. In fact, some of the spots in question I am inclined to refer to the use of tobacco or snuff. Whether all cases are to be explained in this way is, however, open to question, with probabilities against such explanation. Nevertheless, it is well for practitioners to be forewarned upon this chance of error in diagnosis. Several authors have assumed that the spots on the tongue represent a symptom which has only recently been observed in this disease. In this connection, it is interesting to note that early authors—for instance, Cragin (1836a) and Imray (1843)—in writing upon dirt-eating have described these same spots.

NECK.

The cervical pulsations are often very evident, and in some cases may be seen from six to twelve feet away. (See Circulatory System, p. 404.)

THORAX.

In emaciation the thorax corresponds to the general emaciation of the extremities. In some cases the ribs are very prominent.

Heart.—See page 407.

Breasts.—See page 397.

ABDOMEN.

"Pot-belly" or "Buttermilk-belly," Dropsy, and Tympanites.—The condition known as "pot-belly" or "buttermilk-belly" is exceedingly common in uncinariasis, especially in extreme cases in summer. It is a distension of the abdomen, due apparently to two factors: (1) A gaseous distension of the bowels, and (2) the presence of an excess of fluid in the abdominal cavity.

I hasten to add that I have not seen a single autopsy in man infected with uncinariasis, but the same abdominal distension is found in animals suffering from this disease, and a number of post-mortem examinations, especially on sheep, have given the conditions described.

Lutz mentions flatulence of the lower abdomen as a common symptom, and Sandwith (1894, p. 11) found it present to a slight extent in one-third of the cases.

Hair.—See page 397.

Genitalia.—See page 416.

EXTREMITIES.

Nothing of any particular note was observed in connection with the bones; for the muscles see p. 432. In many cases the feet and ankles were swollen, and in several cases the legs were marked with ulcers. See p. 398.

According to Sandwith (1894, p. 12), edema of the legs, like albuminuria, is to be seen only in the worst cases, and some of these had general edema when admitted in a dying condition.

GENITALIA.

See page 416.

MUCOUS MEMBRANES.

All mucous membranes correspond, in respect to their color, to the grade of anæmia. (See Eyelids, p. 398; nostrils, p. 400; lips and gums, p. 400; tongue, p. 401; genitalia, p. 416.)

EXCRETIONS AND SECRETIONS.

URINE.

I have no observations to record in regard to the urine. Sandwith (1894, p. 11) states that:

"The urine is not unlike that of ordinary anæmia, neutral or alkaline in equal proportion, and rarely acid, pale colored, with specific gravity ranging from 1010 to 1015. A trace of albumen was present in all the most advanced cases, without casts under the microscope."

According to Zinn and Jacoby (1898, p. 16), Lussana (1890) found in the urine of patients suffering from uncinariasis a poisonous substance of the nature of a ptomaine, which caused extensive changes in the rabbit's blood, especially a change in the number of red blood corpuscles, and also poikilocytosis. These results are said to have been confirmed by Arslan (1892).

FECES.

Consistency.—The feces may be hard or soft, according to the presence of constipation or diarrhea.

Reaction.—In reaction the feces may be acid, alkaline or neutral.

Color.—In a large proportion of medium and severe cases, the feces are reddish to brown in color. In some cases blood is present.

Blotting Paper Test.—In about six or seven out of ten medium and severe cases, if a portion of the feces is placed upon white blotting paper, and allowed to remain there for twenty minutes to several hours, it leaves on the paper a reddish brown stain similar

to a blood stain. This test will be found useful by physicians who are not prepared for microscopic tests, but is subject to error and must not be relied upon too confidently.

Microscopic Examination.—If feces less than twenty-four hours old are examined microscopically, the eggs will be found in various stages of segmentation. If feces over twenty-four hours old are examined the free embryos also are usually found. If free embryos are found in perfectly fresh feces, the diagnosis of infection with the worm (*Strongyloides stercoralis*) of Cochin-China diarrhea must usually be made, and this parasite we may find in the same patient in whom uncinariasis is present.

CIRCULATORY SYSTEM.

The symptoms of the circulatory system are the most marked and most common; they seem to develop after the symptoms of the digestive system, but before those of the nervous system.

ANAEMIA.

In all medium and severe cases, the anæmia is what first attracts attention. This varies in intensity not only in proportion to the degree of infection, but also to a considerable extent in proportion to the length of the period of infection. For instance, 100 worms may be expected to produce a greater anæmia within a given time, say one year, than will fifty parasites. But fifty worms may be expected to produce more anæmia in two years than in one.

In some medium cases, the blood-vessels of the conjunctivæ may be more or less visible, and the visible mucous membranes of the nose, mouth and vulva may be more or less of a normal or subnormal color. In the extreme cases, these structures may be as white as marble or paper. In the same way the color of the skin will vary (see Skin, p. 392; nails, p. 398) from an almost natural hue to a whitish, lemon yellow or tan color.

Blood.—I did not stop for blood counts, as these have been made by other men, and while they are exceedingly interesting from a

pathological standpoint they have not appealed to me as so direct a method of diagnosing intestinal parasites as is the fecal examination. In general it may be said that the blood of man corresponds to the blood of sheep, goats, cattle, dogs, etc., suffering from the same disease; in other words, the severer and longer the infection, the thinner the blood. In the vernacular of the sand lapper, it is "like water." It may here be added that in early literature on dirt-eating, several authors remark upon the water-like appearance of the blood.

Speaking in more technical language, the blood has been shown by Ashford to possess the following characteristics:

"(1) A severe anæmia, falling as low as that of Addison's anæmia in count of red cells in some cases. (2) A very low hæmoglobin average and a very low color index. (3) A marked eosinophilia in some cases; 40 per cent reached in one case. This follows the observation of Neusser. (4) No leucocytes common to the disease itself. Leucocytosis recorded is always apparently due to complications, as noted. (5) Frequent presence of normoblasts, and in some cases megaloblasts, but never a majority of megaloblasts. (6) Poikilocytosis common. Manson denies this."

Ashford gives the following interesting table of blood counts:

perature during their stay in the hospital, but that two-thirds had a distinctly subnormal range, varying from an average of 36.3° C. a. m. to 36.9° C. p. m.

"Many of these patients when convalescent had an increase of half a degree, night and morning.

"Surgeon-Major Giles suspected that many of his patients in Assam had suffered from fever at the onset of their malady, and he was confirmed in this impression by observing pyrexia in the monkeys he fed on anchylostoma embryos. After eliminating all those who had fever in the hospital, or a history of intermittent fever or any enlargement of the spleen, I found 68 per cent of the remaining stated that their trouble had begun with a few days' fever." (Sandwith, 1904, p. 12.)

RESPIRATORY SYSTEM.—NOSTRILS.

See page 400.

RESPIRATION.

Many patients complain of a difficulty in breathing, specially after exertion. This symptom is quite natural, in view of the low condition of the blood and the emaciation of the muscles. Respiration is rather variable and does not appear to be a symptom of very great value; it may be slow, or it may be increased to about thirty or more per minute. According to Sandwith (1894, p. 12) dyspnea and noises in the ears were present, as might be expected with marked anæmia.

MUSCULAR SYSTEM.—EMACIATION.

A progressive emaciation is more or less common, especially in severe cases. The arms and legs seem to be reduced to skin and bones; the chest is so emaciated that the ribs are very prominent and the beating of the heart is very evident. What little muscle is left is soft and flabby.

Emaciation is, however, not present in all cases, and even in some medium infections the muscles may be well formed and more or less hard. I recall one case in particular: A boy about 14 who showed a heavy infection microscopically, a clear clinical history

of uncinariasis of several years standing, decided anæmia, distinct cervical pulsations, abdomen rather distended ("pot-bellied"), yet his arms and legs were well formed and his muscles surprisingly solid for a patient in his condition.

Sandwith (1894, p. 13) found the average weight of 100 grown men upon admission to the hospital to be 117.5 pounds; the average height of these men was 5 feet 5.5 inches, which by Dawson's tables should scale at least 135 points. Of the patients who stayed in the hospital more than two weeks 70 per cent gained weight, 22 per cent lost, and 8 per cent remained stationary. The average loss of weight was 3.2 pounds, and was, of course, caused by the necessary starvation, thymol, and purging. The average gain was 5.4 pounds, some patients gaining as much as fifteen, seventeen, eighteen, or twenty pounds.

GREAT PHYSICAL WEAKNESS.

One of the most pronounced symptoms complained of is a general weakness. The patient states that he is obliged to rest after exertion. In light cases a feeling of lassitude is experienced without being able to assign it to any particular cause; as a result, it is generally assigned by other people to laziness. In medium cases the patient may be able to work one to three or four hours before becoming exhausted; in very severe cases he will scarcely be able to walk across the room, or he may be confined to the bed for weeks at a time. A physical examination usually shows an emaciation proportionate to the weakness.

DIGESTIVE SYSTEM.—LIPS, GUMS, TEETH, AND TONGUE.

See page 400.

NAUSEA.

Nausea was not noticed. Sandwith (1894, p. 11) states that vomiting and nausea are rarely complained of.

APPETITE.

The appetite may be light or ravenous. According to Sandwith, the appetite is invariably affected, sometimes ravenous at begin-

ning, but later always capricious and diminished. The English nurses report to him that the patients were always begging for medical comforts or cigarettes, even in the middle of the night, when other patients were asleep. Among forty men carefully examined, sixteen said that their appetite was once greatly exaggerated, sixteen pleaded diminution from the beginning of their illness, and eight believed that their appetite was normal until the anæmia became very marked.

Perverted Appetite, "Dirt-eating."—The most important point to be noticed in connection with the appetite is the abnormal desire for some particular article of food. Frequently this is a preference for something sour or bitter.

Many patients with uncinariasis are known throughout the village or county as being especially fond of pickles. I have seen boys and girls in advanced cases of this disease who would greedily devour an entire bottle of pickles. Some patients are especially fond of sucking lemons, or lemons and salt, or salt alone. Others are known for their desire to chew coffee, or to drink large quantities of strong coffee without milk or sugar. Some are abnormally fond of buttermilk. Others are noted as "resin-chewers." Some are accused of "lapping sand." Many are accused of eating clay or dirt.

Dirt-eating has been discussed by a number of authors, opinion being divided as to its status. Some writers look upon it as the cause of the disease; others view in the habit only a symptom or a result; still others consider it nature's treatment of a diseased condition.

Among helminthologists there seems to be the impression that dirt-eating is especially likely to lead to infection with parasites. Among Southern physicians I found the idea quite prevalent that dirt-eating was one of the causes of the condition which I have classed as extreme uncinariasis.

During the trip now under discussion, I have had opportunity to observe many so-called dirt-eaters. As most authors state, it is exceptional that one will acknowledge that he eats dirt. I believe

the explanation of this denial is very clear, namely, not only is there a certain amount of disgrace connected with the reputation of being a dirt-eater, but probably not over one person in ten, or possibly in twenty, accused of eating dirt ever does so. The other nine to nineteen have their abnormal appetites developed in a different direction, namely, pickle eating, lemon sucking, coffee chewing, resin chewing, etc.

Among the articles eaten by these "dirt-eaters," various authors mention charcoal, chalk, dried mortar, mud, clay, sand, gravel, stones, shells, rotton wood, cloth, garments, paper, tobacco pipes, mice, young rats, etc.

It is I believe an error to attempt to reduce this abnormal habit to any one common basis. In general, however, it may be stated that the alleged "dirt-eating" in this country practically represents the severe cases of uncinariasis. To attempt to reduce dirt-eating to infection with worms, particularly with *Uncinaria americana*, will doubtless be thought extreme, more particularly by Northern physicians. Still the idea is not a new one, and a moment's consideration will show that this view is far less extreme than it at first appears.

For an excellent general discussion of dirt-eating, with extensive references to literature, I refer you to Le Conte (1845). For the purpose of the present paper it will suffice to call attention to certain facts and analogies. The habit of eating slate pencils, paper, and other objects by chlorotic girls is more or less commonly known. Pregnant women, also, may develop an abnormal appetite, which takes different phases, including dirt-eating. It is recorded that the Javanese women eat certain dirt in order to improve their appearance. In certain localities in tropical America (Orinoco) the natives eat earth during the overflow of the river when they can not obtain their regular food. Earth eating is said to be common and not injurious in certain parts of Africa. According to Sandwith (1894, p. 9), on the day of the maximum high Nile, and the general rejoicings thereupon, the town crier, who is on the lookout for backsheesh, presents "teen ibliz" (Nile mud) with a

lemon to the inhabitants for luck, and many of them eat of it. Dogs, horses, cattle, hogs, and alligators are recorded as eating clay and sticks. The Alaskan seals, when infected with round worms, eat pebbles. Elephants, when infected with flukes, eat a certain kind of clay until a looseness of the bowels is produced. I have frequently heard Texas grangers attribute the death of cattle to aeting sand, and in post-mortem examinations of cattle, sheep, and goats, in an anæmic condition from intestinal worms (verminous gastritis caused by *Hæmonchus contortus, H. Ostertagi,* etc., and in infection of small intestines with *Uncinariasis trigonocephala* and *U. radiata*), I have repeatedly noticed in the stomach and intestine large quantities of sand; so that the farmers present declared that this was the cause of death. Dogs infected with intestinal worms eat grass. Cats also frequently eat grass, probably from the same cause. Children infected with eel worms (*Ascaris lumbricoides*) are known to occasionally eat dirt, and I know of one such case where the habit ceased when the worms were expelled.

In view of the comparisons cited, it would seem that the idea of considering dirt-eating as a manner of infection with parasitic worms, although conceivable for some cases, is hardly correct as applied to most instances. That dirt-eating is an abnormal appetite due to a diseased condition (anæmia and a disordered digestive system) as suggested by several authors as early as the first half of last century, seems to me to be an explanation of much more general application; and that this anæmia and enteritis or gastritis may be produced by parasitic worms is an established fact. In this connection, it is interesting to note that Hancock (1831, p. 67), in discussing dirt-eating, mentions "worms preventing the nourishing effects of food;" Imray (1843, p. 310) remarks that "worms in considerable numbers were not uncommonly accumulated in the intestinal canal." Further, it is significant that various authors, in discussing the treatment of dirt-eating, attribute more or less success to certain drugs which are in fact used more or less in treating for intestinal parasites. Thus, Cotting (1836a) refers,

as stated above, to the decrease of dropsy and of dirt-eating corresponding to the more general use of calomel; sulphate of iron is mentioned by Cragin (1836a), Pollard (1852), and others; according to Pollard (1852), copperas is a popular and successful remedy among the negroes; Hancock (1831) refers to a remedy containing arsenic as having had great success; Jordan (1832) states that dirt-eating decreased upon destroying the huts and moving the families to some other location.

To summarize: While it would seem decidedly extreme and unwarranted to maintain that dirt-eating is necessarily an indication of infection with intestinal worms, still I believe the conclusion is justified that it is undoubtedly a more or less common tendency in such infections, not only in man but also in other animals. It may be classed with the chewing of slate pencils, resin, coffee, sucking of lemons and salt, etc., as an abnormal appetite due to the anæmia and abnormal condition of the intestinal tract. Further, for all practical purposes it is not much of an exaggeration to look upon most, if not all, so-called dirt-eaters of the sand areas of our Southern States as representing severe cases of uncinariasis.

Sandwith (1894) states that 26 per cent of his patients confessed to eating earth, and he refers to "earth hunger" as sometimes the cause and sometimes the effect of hookworm disease.

PAIN IN THE STOMACH; INDIGESTION.

Many patients complain of colicky pains "in the stomach," and will indicate the region between the navel and the ensiform cartilage as the seat of the "misery." Indigestion is frequently mentioned, and the tongue is occasionally coated.

Just how much the indigestion is due to uncinariasis and how much to other causes may be considered an open question. Foul breath is mentioned by some authors as a common symptom of uncinariasis, but this has not been particularly noticeable in many of the cases I saw.

Many authors explain the tendency to dirt-eating as an effort to neutralize the hyperacidity of the stomach. As I have just shown

(p. 411), however, many patients with uncinariasis eat pickles and suck lemons.

According to Sandwith, a gnawing, throbbing pain in the epigastrium is the first symptom complained of, chiefly because it is constant, whereas a severe colic and borborygmi (rumbling of bowels caused by gas) of intestine are present from time to time. I was unable to confirm the constancy of the pain.

CONSTIPATION AND DIARRHEA.

Sandwith (1894, p. 11) states that when the patient is not under thymol and purgative treatment, constipation is a very constant symptom in hospital cases; 60 per cent had suffered for a long time from obstinate constipation, 28 per cent had had diarrhea before admission, and 12 per cent had no recollection of being troubled with either. "None of the figures depending upon the memory of the patients must be taken as absolute truth, as the intelligence of many is of a very low order." Diarrhea, and even dysentery, are not uncommon in very advanced cases, especially those complicated with *Bilharzia* (=*Schistosoma,* which has not been reported as endemic in the United States), or ulceration in the rectum; and unless the patient is robust enough to support thymol, such cases are apt to end fatally.

In my own cases I found both constipation and diarrhea, but I am not in a position to state that either symptom was regular or characteristic for any given degree or stage of infection. In severe cases diarrhea was certainly more or less common.

Feces.—See page 403.

NERVOUS SYSTEM.

The nervous symptoms usually develop later than either the intestinal or the circulatory symptoms.

EYES.

See page 398.

EARS.

According to Sandwith (1894, p. 12), noises in the ear are present. None of my patients complained of this symptom.

MENTAL LASSITUDE, HEADACHE, DIZZINESS AND NERVOUSNESS.

Not only does physical exertion result in exhaustion, but mental exertion has to be avoided. The children complain that they are unable to study and that any continued application to books results in severe headache. This feature of the disease is fully confirmed by the testimony of both teachers and parents, who assert that children of this class are usually much more backward (and even stupid in their studies) than other children not showing the symptoms under discussion.

Dizziness is very commonly mentioned by the patients. This feeling, which they usually speak of as a "swimming in the head," is experienced especially upon rising suddenly from a chair or a bed.

Nervousness does not seem to be so commonly complained of as mental lassitude, headache and dizziness. Still it is more or less frequently mentioned, more particularly by the girls and women.

Among girls from about thirteen to twenty years of age it was quite noticeable that they were more timid and more emotional than their healthier sisters.

According to Sandwith (1894, pp. 11-12), there is pain in the head, generally referred to the temples, while in the knees there is almost invariably present great weakness and some pain; occasionally there is in addition pain in the shoulders. Giddiness is another very general symptom, and it is this as much as anything else which compels the patients to give up work. The worst cases are those which are nearly always asleep, and can not be interested in anything when they are awake. On the whole, sleepiness is decidedly a symptom. Dense stupidity, associated sometimes with reiterated demands for a favor already granted, shows that the bloodless brain is affected in all advanced cases, and at least three times Sandwith (1894, p. 13) found a condition of weak-mindedness which would have warranted the patient being sent to the asylum.

PATELLAR REFLEX.

Absence of patellar reflex is reported in cases of general debility

and muscular weakness. Sandwith (1894, p. 13) found this reflex unaltered in 35 per cent of the cases examined, completely absent in 48 per cent, decidedly diminished in 5 per cent, and a little exaggerated in 12 per cent, all of which were early cases.

GENITAL SYSTEM.—EXTERNAL GENITALIA; SEXUAL FUNCTION; MENSTRUATION; STERILITY.

In cases where infection has taken place in early childhood, the delayed development of the genital system is very marked. Patients of sixteen to twenty-two years of age may not be better developed than healthy persons of eleven to fifteen years. Menstruation may be very irregular, especially in summer. This same condition is insisted upon in many early writings on dirt-eating. Mothers frequently ascribe the condition of their daughters to the absence or irregularity of the menstruation as is mentioned also in early writings on dirt-eating.

Sandwith (1894, p. 13) found impotence to be a decided symptom in hookworm disease. Of thirty-eight men, especially examined on this point, twenty-four had completely and five had almost entirely lost their virile power, while the remaining nine men, five aged from nineteen to twenty-five, had their puberty considerably delayed.

TENDENCY TO ABORTION.

Among women affected with uncinariasis I found a marked tendency to abortion. Given a woman about twenty-eight years old who had been married nine years—a not uncommon history is that she has had three to five children and three to four miscarriages, and she looks to be about fifty years old. Not being able to follow these cases through their entire medical history and the history of their husbands, I must leave the question open as to how many of these abortions are to be attributed to uncinariasis and how many are due to other causes. In the country districts I was thrown in with the anæmic, not with the healthy families, hence I have no good basis for comparison of these two classes for the particular localities visited. In some cases a history of venereal disease was sus-

pected or admitted; in others, the abortion came on after pitching fodder; in some cases the patients had taken more or less quinine during their life, under the supposition that they had malaria; and in still other cases, my suspicions were aroused in other directions. The determination of the exact relation of uncinariasis to the miscarriages, which are certainly strikingly prevalent, must be left to those who can follow the cases for a longer period of time.

PREVALENCE OF UNCINARIASIS IN THE UNITED STATES.

In several earlier papers (1901, p. 524; 1902a, p. 778; 1902b, pp. 183, 212) I have advanced the view that uncinariasis must be more common in this country than is generally supposed. In my preliminary report on his trip (see above p. 359), I said that: "There is in fact not the slightest room for doubt that uncinariasis is one of the most important and most common diseases of this part (South Carolina) of the South, especially on farms and plantations in sandy districts."

Harris went even farther than this and claimed that uncinariasis is "the most common of the severe diseases of the South."

In considering the subject of the frequency and economic importance of the disease under discussion, I do not wish to seem to underestimate the prevalence of tuberculosis and of venereal diseases among the negroes or of malaria among the whites. Further, I recognize the fact that at the present moment an exact mathematical estimate can not be made. Speaking in general terms, however, the facts at my disposal at present seem to indicate that taking the Southern Atlantic States as a whole, uncinariasis must be considered as one of the most common and widespread maladies; in frequency it belongs in the general class with malaria, tuberculosis and gonorrhea.

In cities and in rural clay districts it is probably less common than any one of these three maladies, for such localities may present local foci of infection for the diseases in question, while the local foci of infection with uncinariasis are much more limited.

Among the negroes of the rural sand districts, uncinariasis seems to be much less common than either tuberculosis or gonorrhea. Its apparent rarity may, however, be deceptive (see p. 417).

Among the whites of the rural sand districts, uncinariasis is apparently the most common disease found. Nevertheless, in some sand districts, probably with a clay or other impervious subsoil favorable to the formation of marshes, malaria rivals uncinariasis for first place.

From these qualified statements it will be seen that I do not feel justified in adopting the view advanced by Harris, namely, that uncinariasis is "the most common of the severe diseases of the South."

In all probability, further study will show that in Mexico, Central America, and parts of South America, hookworm disease is more important and more common than in the United States.

Sandwith (1894, pp. 5-6), in discussing the frequency of this disease in Egypt, says:

"It is impossible to know what amount of the population (of Egypt) is affected, but the statistics of the recruiting commissioners for 1892 are worth quoting. Nearly every adult male peasant is liable for conscription, and the conscripts are immediately examined in their villages. In upper Egypt 5988 men were called, and 200, or 3.3 per cent were rejected for anæmia. In lower Egypt 661, or 6.2 per cent, were rejected from this cause out of 7420 men. Every province furnished anæmic rejections, but Menoufieh came highest on the list with 13.9 per cent, while I find from hospital statistics that no less than fifteen villages in that province are infected. The recruiting medical officer, who is an Englishman. only rejects those who are obviously too anæmic to serve with the colors, accepting many who are already the hosts of the blood sucking worm. Thus the medical reports for the Egyptian army show that in 1890 there were 114 admissions to the hospital for anæmia, in 1891, 107 admissions, and in 1892, 170 admissions. In 1891, twenty-two soldiers were invalided from the service for anæmia, and sixty-five in 1892, besides one death. The number of admissions for debility is equal to those for anæmia, and doubtless includes many cases of anchylostomiasis."

Dobson (1893, p. 63) examined 547 of the healthiest looking coolies from India and found hookworms in no less than 454 of them.

CLINICAL DIAGNOSIS OF HOOKWORM DISEASE.

As stated above, a man who is familiar with this disease should have no difficulty in recognizing severe cases, especially if he is in the area of infection. In light and medium cases, however, it is unsafe to make a diagnosis upon symptoms alone, unless such cases are associated in the same family or neighborhood with severe cases. The best and most reliable method of diagnosis is by fecal examination, although in blood examination increased eosinophilia indicates the possibility of intestinal parasites.

First of all let us recall that uncinariasis is a possibility which should be considered in conection with all cases of anæmia, especially among earthworkers, as in miners, brickmakers, canal diggers, farmers, etc., or in persons returning from the tropics, and among persons who have a history of residence on sandy soil. Three methods of fecal examination are open to us—the blotting-paper test and the microscopic and the gross examinations.

BLOTTING PAPER TEST WITH FECES.

For persons who are not in a position to make a microscopic examination, the blotting paper test (referred to on p. 403) will be found very useful. To make the test, use only fresh feces. Place an ounce or more of the stool on a piece of white blotting paper (any absorbent white paper will answer the purpose); allow it to stand for twenty to sixty minutes; remove the feces and examine the color of the stain. In about four out of five cases of medium or severe uncinariasis, the stain is reddish brown and immediately reminds one of a blood stain. In making this test on anæmic patients, piles should, of course, be excluded.

It developed in my work in the Virginia penitentiary that this test is open to error in dealing with criminals. In order to avoid work, convicts, especially hard labor contract convicts, occasionally produce a hemorrhage purposely by wounding the mucosa of the rectum by means of some sharp instrument.

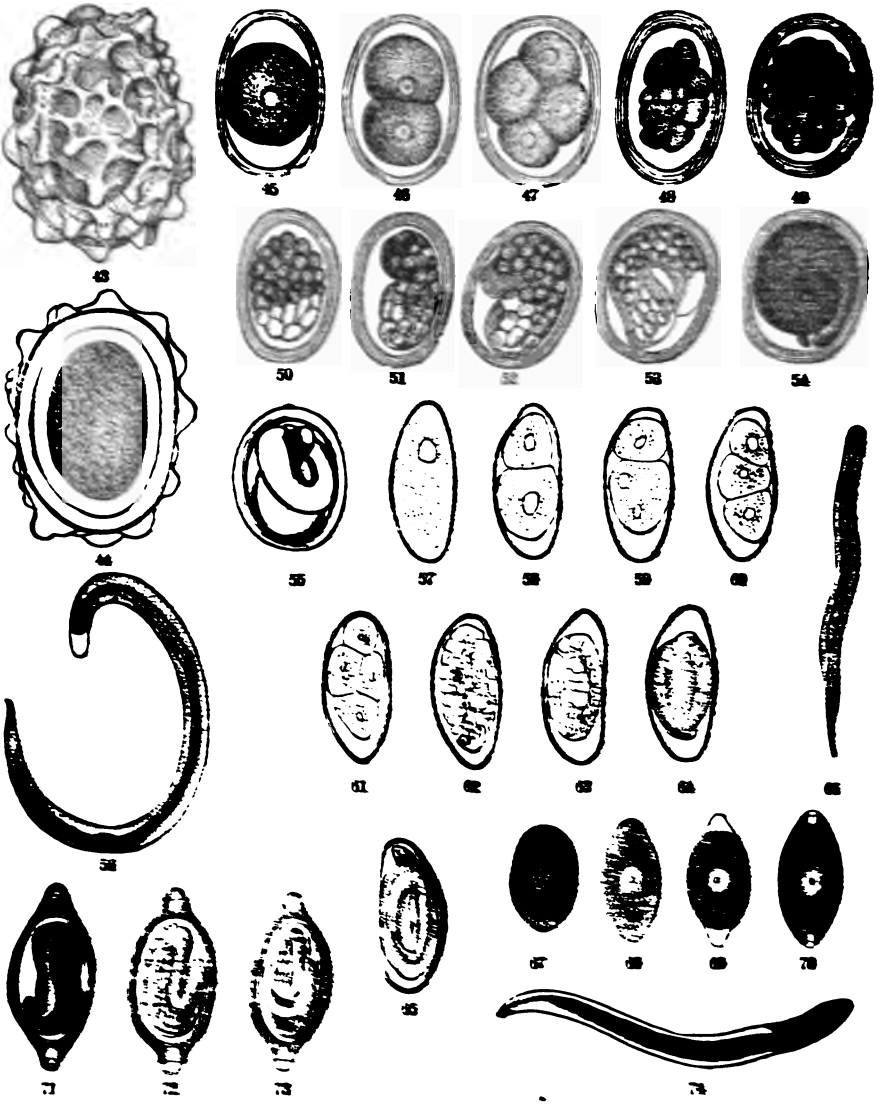


FIG. 45. Egg of the common ascaris (*Ascaris lumbricoides*) of man, as found in feces. Seen with superficial focus. Greatly enlarged. After Stiles, 1896, p. 32, fig. 58.

FIG. 46. The same, as seen with median focus. Greatly enlarged. After Stiles, 1896, p. 32, fig. 59.

FIGS. 47–54. Embryology of the common ascaris (*Ascaris lumbricoides*) of man, showing the changes undergone by the egg after being discharged in the feces. After Leuckart, 1887, p. 213, fig. 56.

FIG. 55. Embryo of the common ascaris (*Ascaris lumbricoides*) of man, in the eggshell. (After Leuckart, 1887, p. 215, fig. 56.

FIG. 56. Free embryo of the common ascaris (*Ascaris lumbricoides*) of man, casting its skin. After Leuckart, 1887, p. 214, fig. 56.

FIGS. 57–64. Embryology of the common pinworm (*Oxyuris vermicularis*) of man, showing the changes undergone by the egg while in the female worm. After Leuckart, 1886, p. 32, fig. 31.

FIG. 65. Embryo of the common pinworm (*Oxyuris vermicularis*) of man, in the eggshell, as found in fresh feces. After Leuckart, 1886, p. 32, fig. 30.

FIG. 66. Full-grown embryo of the common pinworm (*Oxyuris vermicularis*) of man, after it has escaped from the eggshell. After Leuckart, 1886, p. 32, fig. 30.

FIGS. 67–70. Egg of the common whipworm (*Trichuris trichiuris*) of man, showing changes undergone while still in the female worm, fig. 70 is the stage found in fresh feces. After Leuckart, 1886, p. 68, fig. 25.

FIGS. 71–73. Later stages of development of an allied whipworm (*Trichuris ovis*) of sheep and cattle, showing changes after the egg escapes in the feces. After Leuckart, 1886, p. 69, fig. 26.

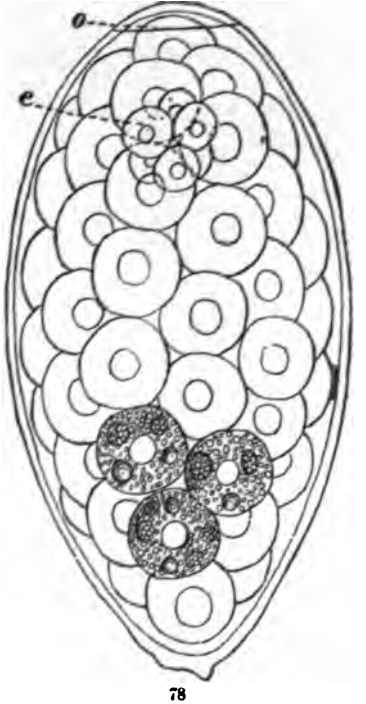
FIG. 74. Internal embryo of [illegible] After Leuckart, 1886, p. 68, fig. 27.

FIG. 75. Egg of Cochin-China diarrhea worm (*Strongyloides stercoralis*) found in stools. (After Thayer, 1901, pl. 9, fig. A.)

FIG. 76. Rhabditiform embryo of same, from the stools. (After Thayer, 1901, pl. 9, fig. B.)

FIG. 77. Filariform larva of same derived, by direct transformation, from a rhabditiform embryo. (After Thayer, 1901, pl. 9, fig. C.)

Figures 75 to 77 were drawn from life, as seen under Leitz, objective 7—ocular 3.



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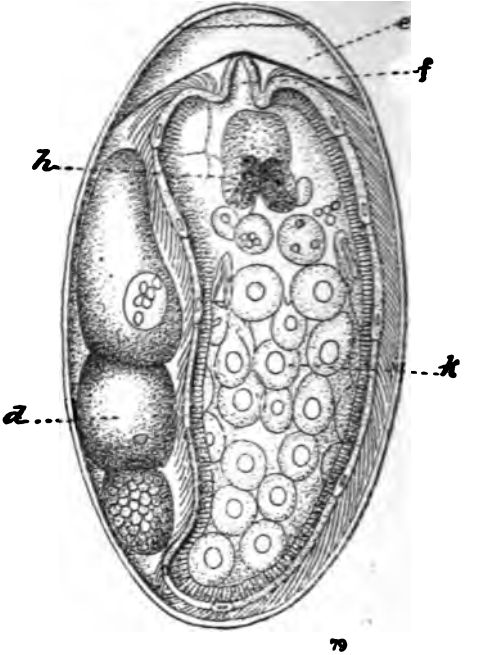

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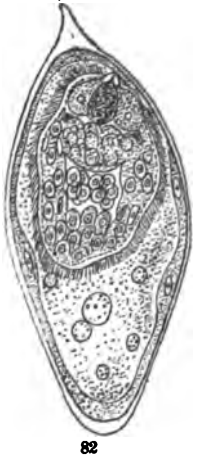

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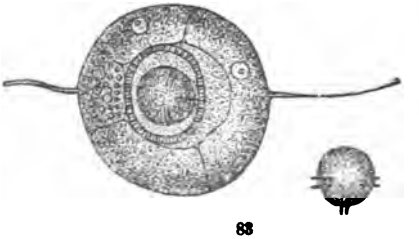

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80

FIG. 78. Egg of the common liver fluke (*Fasciola hepatica*) examined shortly after it was taken from the liver of a sheep; this is the same stage that is found in human feces; at one end is seen the lid or operculum, *o*; near it is the segmenting ovum; the rest of the space is occupied by yolk cells which serve as food; all are granular, but only three are thus drawn. × 680. (After Thomas, 1883, p. 281, fig. 1.)

FIG. 79. Egg of the common liver fluke containing a ciliated embryo (miracidium) ready to hatch out; *d*, remains of food; *e*, cushion of jelly-like substance; *f*, boring papilla; *h*, eye-spots; *k*, germinal cells. × 680. (After Thomas, 1883, p. 283, fig. 2.)

FIG. 80. Embryo of the common liver fluke (*Fasciola hepatica*) boring into a snail. × 370. (After Thomas, 1883, p. 285, fig. 4.)

FIG. 81. Egg of lancet fluke (*Dicrocœlium lanceatum*) with contained embryo. × 700. (After Leuckart, 1889, p. 379, fig. 171.)

FIG. 82. Egg of human blood fluke (*Schistosomr hæmatobium*) with contained embryo, passed in the urine or in the feces. × 285. (After Looss, 1896, pl. 11, fig. 112.)

FIG. 83. Egg of beef-measle tapeworm (*Tænia saginata*) with thick eggshell (embryophore), containing the six-hooked embryo (oncosph· (After Leuckart.)

MICROSCOPIC EXAMINATION OF FECES.

No special technique is necessary. Simply take a small amount of feces, preferably from near the surface, about the size of the head of a large pin; spread this out in a drop of water on an ordinary microscopic slide and cover the preparation with a cover slip. Examine under any moderately high power, as a Zeiss 8 mm., Zeiss C, or a Bausch & Lamb one-third inch. Look carefully, with not too strong illumination, for an elongate oval egg with thin shell, and with protoplasm either unsegmented or in the early stages of segmentation. The older the feces and the warmer the weather the more advanced will be the segmentation. In case of infection with *Uncinaria americana* the fully developed embryo may be found within the eggshell. Be cautious not to mistake for the eggs of the *Uncinaria* the eggs of *Ascaris lumbricoides,* which have a thick gelatinous, often mammillated, covering and an unsegmented protoplasm (figs. 43-44), or the eggs (figs. 57-65), of *Oxyuris vermicularis,* with a thin asymmetrical shell (one side being almost straight) and containing an embryo, or the eggs of whipworms (*Trichuris trichiura,* more commonly known to physicians as *Trichocephalus dispar*), possessing a smooth, thick shell, apparently perforated at each pole, and an unsegmented protoplasm (fig. 70.)

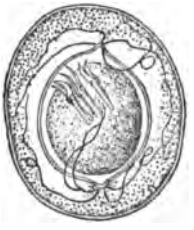

FIG. 85. Egg of the dwarf tapeworm (*Hymenolepis nana*) of man. Greatly magnified. (After B. H. Ransom, unpublished.)

As a rule, in fecal examination I prefer to use the thick, large, 2x3-inch slide, such as is used in examining for trichinæ, rather than the ordinary 1x3 thin "English slide." The larger slide is

not only more steadily and more easily manipulated in case one is working without a mechanical stage, but it is much cleaner to handle.

In most cases of infection with intestinal worms the simple method just described will suffice for a positive diagnosis. Before giving a negative opinion, however, I invariably make ten preparations or follow a procedure which we may call "sedimenting the feces." Experience has shown me that in cases of negative diagnosis by the simple method positive diagnosis occasionally results if the feces are washed and "sedimented."

Method of Washing and Sedimenting Feces.—Take one or two ounces of feces, fresh or dry, mix with water, and place in a large bottle, retort, jar, or any other receptacle; add enough water to make from a pint to two quarts, according to the amount of feces; shake or stir thoroughly and allow to settle; pour off the floating matter and the water down to near the sediment; repeat the washing and settling several times, or as long as any matter will float. The last time this is done use a bottle or graduate with a smaller diameter, and when the material is thoroughly settled examine the fine sediment. It will be found that the eggs have settled more numerously in the fine sediment than in the coarse material.

In case an unusual amount of large coarse material is present in the feces, it is sometimes convenient to pour the entire mass through a sieve, rejecting the portion left in the sieve; or to wash the feces in a sieve, holding the latter under water. As a rule, however, the sieve is not very useful in fecal examination.

The centifuge does not appear to be of any special value in fecal examinations.

If facilities are not at hand for making a microscopic examination, about half an ounce of either perfectly fresh feces, or of rather dry feces, may be placed in a bottle, preferably with a large neck, properly packed in a mailing case, and sent to any professional pathologist or zoologist for examination.

GROSS EXAMINATION OF FECES.

If uncinariasis is suspected and it is not practicable either to

make a microscopic examination or to delay matters until a specimen can be sent away for examination, still another method of diagnosis is possible. Give a small dose of thymol, followed by salts, and collect all of the stools passed. Wash the stools thoroughly several times in a bucket, and examine the sediment for worms about half an inch long, about as thick as a hairpin or hatpin, and with one end curved back to form a hook. If these are found, institute definite treatment.

TREATMENT OF HOOKWORM DISEASE.—ANTHELMINTHIC TREATMENT.

The two drugs most commonly used in uncinariasis are thymol and male fern. The day before treatment the patient is placed on a milk and soup diet for three days.

Thymol.—The directions usually given for thymol treatment are these: Two grams (thirty-one grains) of thymol at 8 a. m.; two grams (thirty-one grains) at 10 a. m.; castor oil or magnesia at 12 noon.

One week later the stools should be examined, and if eggs are still present, treatment should be repeated until the eggs disappear, but it is not best to give the thymol more than one day per week. Some cases of hookworm disease are quite obstinate and require a treatment extending over several weeks. It is, therefore, an unfortunate error to expel a few worms with one or two doses and then dismiss the patient as cured without having made further microscopic examination for eggs.

Sandwith (1894, p. 21) reports forty-two men cured after a single dose; fifty-eight after two doses; forty-three after three doses; twenty-five after four doses; nine after five doses; four after six doses; two after seven doses, and two after eight doses.

A number of writers, particularly Giles, Sandwith, and others, agree that small doses of thymol are valueless, but Sandwith is of the opinion that four grams in twenty-four hours are as efficacious as six grams, and the former dose is certainly less dangerous.

Worms may be found in the stools as early as eight hours after

the first dose of thymol. In fifty cases Sandwith counted 1301 worms in stools passed within eight hours after the first dose and 444 worms within the nevt sixteen hours. From his context, however, it is clear that brandy was given to these patients (see below), hence the thymol was dissolved more rapidly. Giles reports that he seldom found any worms until twelve hours after the first dose of thymol. "Occasionally patients vomited after swallowing thymol, but as a rule they retained it perfectly," and "they used to ask for an extra dose of it while convalescing."

Sandwith goes on to say that "large doses of thymol have a poisonous effect on the system, not unlike those produced by carbolic acid. The temperature is lowered one or even two degrees centigrade, and both pulse and respiration are slowed. The patient remains for a few hours collapsed, giddy, and faint, and has to be kept lying down, but at sunset he is quite well again and asking for food." He gives the following as a typical case:

"January 14, 1892.—6 a. m., temperature 37.5°, pulse 80, respiration 19; patient in his usual state and was given two grams of thmyol. 7 a. m., temperature 37°, pulse 80, respiration 19; says he has slight nausea, giddiness, and colicky pains in the epigastrium. 8 a. m., two grams more of thymol given. 9 a. m., temperature 35.5°, pulse 70, respiration 17; great giddiness, can not stand or walk; very sleepy, and talks like a drunken or very sleepy man. 12 a. m., symptoms much the same; sweating while asleep. 2 p. m., temperature 37.5°, pulse 75, respiration 18; apparently quite well again. Says he does not mind the thymol, except that it makes him lose consciousness."

Some authors advise the use of alcohol with thymol, others warn against such use. Sandwith, in referring to this subject, says: "Warned by the death of at least one of my patients immediately after digesting the thymol, I have always administered to feeble men twenty-five grams of brandy with each two grams of thymol, with the happiest results."

Authors who warn against the use of alcoholics during treatment do so on the ground that thymol is soluble part for part in

alcohol, hence will more quickly be absorbed by the system. With one of my assistants (see Stiles & Pfender, 1902a), in the Bureau of Animal Industry, I treated a number of dogs with thymol in various forms. We gave doses varying from 10 to 100 grains (0.648 to 6.48 grams) to dogs weighing from eight to thirty-five pounds. In alcoholic solution, thirty grains (1.94 grams) caused convulsions in a dog weighing fifteen pounds, and severe convulsions in a dog weighing fourteen pounds; on the other hand, an eight pound, old dog suffered no ill effects after thirty grains in alcohol, and a thirty-five pound dog took seventy-five grains (4.86 grams) in alcohol without deleterious effect. In tablet form, without oil, a single dose of 100 grains (6.48 grams) killed a dog of fifteen pounds in four days; a dose of fifty grains caused a twelve pound dog to attempt to vomit; a dose of seventy-five grains was without appreciable effect in a dog of thirty-five pounds; thirty grains were without effect on a dog of eight pounds; daily doses of twenty grains each caused a slight diarrhea after six days in a dog of fifteen pounds; the same dose caused a seventeen pound dog to be quite sick on the sixteenth day. In tablet form, with castor oil, thirty grains caused a twelve pound dog to attempt to vomit, while doses of ten and twenty grains were negative on dogs weighing twelve to fifteen pounds. In powdered form, without oil, twenty grains caused a twelve pound dog to attempt to vomit, while doses of ten and twenty grains respectively were negative in dogs of twelve and fifteen pounds; forty grains caused no ill effects in a dog of eight pounds, and a dose of eighty grains was without effect on a dog of thirty-five pounds. In powdered form, with castor oil, twenty grains caused slight convulsions in a dog weighing fifteen pounds, but doses of ten and twenty grains were negative on dogs of the same weight. Blue foxes to which we gave three grains in alcohol became quite sick. Theobald states that a dose of three grains has produced partial prostration in a bull terrier, but he does not give the weight of the dog.

According to Sandwith, the contra indications for thymol are "excessive debility, very low temperature, age above 60, and

advanced diseases of the heart or any other organ. Boys take it very well in half quantities."

Sandwith states (1894, p. 17) that of eight fatal cases treated with thymol two died, he thinks, in consequence of the thymol, eleven in forty-eight hours, respectively, after taking the dose; both of these men had previously had thymol without bad effect, but they were both in a miserable state of exhaustion and debility. He does not think that thymol accelerated the deaths of any of the remaining six cases, which occurred five, six, nine, thirteen, fifteen, and nineteen days, respectively, after the last dose of thymol. Three of these cases were over sixty-five years of age.

While my experience with thymol in man is very limited, I must confess that from my experiments upon animals, I am afraid of the use of alcoholics *per os* during treatment, and in the case of weak patients I should be more inclined to use a stimulant hypodermically than run the risk of dissolving the thymol too rapidly or in too great quantity at one time. Furthermore, it is at least doubtful whether our American hookworm will be so difficult to expel as is the Old World species, because of the absence of the ventral hooks (cf. figs. 5 and 10) in *Uncinaria americana.*

In the case of "excessive debility" and other conditions which Sandwith designates as contra indications for the thymol, it is not clear what drug Sandwith would use, for he states (1894, p. 20) that "for the last three years I have looked upon it as a waste of time to administer any other anthelminthic than thymol for this parasite" [*Agchylostoma duodenale*]. Certainly persons in the conditions described should not be allowed to go untreated, and despite the view advanced by some authors, smaller doses of thymol, repeated one day per week and extending over several weeks, may be expected to yield some results.

Male Fern.—Several European authors advise the use of large doses of extract of male fern in treating hookworm disease. Eichhorst's (1901, p. 314) recent "Practice" places the dose at ten grams (2.5 fluid drams) to twenty grams (5 fluid drams). It has been pointed out by Lépine (1891a, 1891b) and others that such

large doses of this drug are likely to be followed by serious toxic symptoms and even by death. Lépine summarizes the conditions as (1) symptoms of gastrointestinal irritation characterized by the redness and the hemorrhages; (2) nervous symptoms (convulsions and paralysis); (3) albuminuria, and (4) glycosuria, and he warns not to give over eight grams of the extract as a maximum dose. Hare gives the dosage of the extract as four to eight grams (about one to two fluid drams). Male fern should be followed in three to four hours by a calomel purge, aided by a saline, but not by castor or other oils, as the latter increase the danger of absorption, hence of poisoning.

Calomel.—While thymol is at present considered the most reliable remedy in hookworm disease, indications are not lacking that considerable good may be accomplished in the American form of the disease by the use of calomel. This drug will not, however, be followed by such prompt and satisfactory results as will thymol.

GENERAL TREATMENT.

The administration of thymol has for its object the expulsion of the parasite, hence the removal of the cause of the disease. This should be supplemented by efforts to build up the depleted system by means of good nourishing food, iron, etc. It is well to give the iron daily, except on the days that thymol is taken. Sandwith (1894, p. 25) claims that the blood was most benefited by a daily supply of 1.5 grams (twenty-three grains) of the sulphate of iron in water in three equal doses.

PROGNOSIS.

Among physicians I found the view rather prevalent that the prognosis was poor for children who presented severe cases of the disease. This view is probably due to the fact that the cause of the trouble was not understood, hence treatment was not directed to removing the cause.

The proposition now before us is, first, to remove the intestinal parasites, and second, to build up the patients.

To accomplish the first desideratum may require some patience, but efforts will eventually be successful. The second point may also be carried out, unless, of course, the patient is too far gone at the time of treatment to recover from the effects of the disease.

In not all cases can it be expected that a dwarfed, emaciated, and stupid child can be immediately placed upon the same physical and mental basis as his brothers, but even such cases can be greatly improved.

LETHALITY OF HOOKWORM DISEASE.

I know of no extensive and exact statistics regarding the lethality of uncinariasis, and traveling as rapidly as I did, it was impossible to establish any definite facts from personal observation, since it was the exception that I saw any case more than once. Furthermore, owing to the fact that many light cases will escape attention, any lethality percentages published will probably be above the actual figures.

I doubt whether sufficient data are at hand to justify even approximate statements regarding the lethality of hookworm disease. That numerous cases, not properly treated, terminate fatally can not be doubted. Still, it is remarkable how low a person may be with hookworm disease and still live.

Among physicians I met with the most contradictory ideas on this subject. Several excellent observers maintained that all severe cases which reached an edematous condition were invariably fatal; equally keen observers doubted whether this disease was frequently the actual cause of death; the view was quite general that patients suffering from medium or severe attacks of this malady very seldom lived through even medium or light attacks of such diseases as typhoid fever, or pneumonia, and that severe attacks of malaria were frequently fatal; also that they were very uncertain patients in confinement.

In my own observations, several points seemed quite significant. In the first place, the large number of cases of long standing found in so many families did not indicate a high lethality. Further, several adults were seen who had formerly unquestionably presented

severe infections, but who are now in a fairly good state of health. In one family with nine children living, most of whom clearly presented light, medium or severe infections, there was a history of death of nine other children, but satisfactory answers as to the cause of these deaths were not obtained. That some of the children had died of uncinariasis is very probable. On the other hand, families were seen with eight to ten children, all or nearly all in an anæmic condition, some with clear medium to severe cases of uncinariasis, yet without history of any fatal case in the family. I have heard of localities in Central America (but have not investigated them personally) where it is said that a disease, which from its description I believe to be uncinariasis, probably due to *Uncinaria americana,* causes an immense mortality among the children.

Taken all in all, the data obtained did not convince me that uncinariasis, *per se,* is so fatal a disease in man as is generally supposed. On the other hand, I obtained the impression that while very severe cases are not infrequently fatal, the general effects of the malady upon the system are of greater and more far-reaching importance than the lethality of the infection itself. In other words, if uncinariasis were eliminated, the lethality of other diseases, such as pneumonia, typhoid fever, malaria, and also of child birth, would be decreased, and in the sand and mixed sand and clay areas this decrease would not be an insignificant factor.

One physician stated to me that he was confident that he had lost several hundred patients from uncinariasis within the past forty years.

Sandwith (1894, pp. 16-17) states that of the patients nominally under his care, 89.5 per cent were cured or greatly improved, 2.5 per cent were unrelieved, and 8 per cent died.

"Most of the fatal cases had loud anæmic murmurs, marked subnormal temperature, slight general edema, albuminuria, and great mental weakness.

"The actual cause of death was exhaustion, from utter absence of rallying power. It is difficult to believe that the pathological effects are induced only by hemorrhage from the daily suction of

scores or even hundreds of worms. In addition to the loss of blood, we have general thickening and degeneration of the duodenum and jejunum, and consequent interference with normal digestion; then non-assimilation, and eventually a process of slow starvation. It is also worthy of consideration that there may be in prolonged cases some self-poisoning from the great number of bites in the walls of the intestines containing ill-digested and perhaps decomposing food."

POST-MORTEM APPEARANCES.

I did not have occasion to make any autopsies during the trip; hence I am unable to present any original observations in this line. For careful accounts of single cases of autopsies, the reader is referred in American literature to Strong (1901), Yates (1901), Claytor (1902a) and Capps (1903a).

Sandwith's (1894, pp. 17-20) summary of twenty-six autopsies is not accessible to many American physicians; hence it is quoted here in full.

"Some of the earlier autopsies were made by myself, the later ones by Dr. Kaufmann. The muscles were in one case described as of normal color, but in all others they were very pale. There was usually a great absence of subcutaneous fat. The lungs were very pale and edematous in all cases, and all the organs were extremely bloodless.

"In one case there was noted edema of glottis. The heart was found to be hypertrophied ten times (in ten cases), and was very small twice, generally pale brown in color, and on three occasions there were marked changes in the mitral valve. The most common abnormality in the liver was a brownish-yellow fatty appearance. In one case there were several abscesses and the liver weighed 3700 grams, and in one patient there was well-marked jaundice.

"The spleen was enlarged in one-third of the post-mortems. The kidneys invariably showed some change, though this was often much more marked in one kidney than in the other. They were very pale in twenty-four patients, three of whom had several small

cysts. Of the remaining two patients one had granular kidneys and the other had cysts, but the kidneys were of normal color.

"The brain was always exceptionally white, and in one case there was recent apoplexy.

"The small intestines showed, of course, the most important changes. As a rule, there were many hemorrhages and bites in the jejunum and ileum, but in one of the cases where the bites were carefully counted there were only six in the jejunum and ileum, and no worms were found. In another case, however, there were 575 bites in the small intestine, besides 250 anchylostoma. In yet another there were 100 bites, the farthest of which was 4.5 meters from the pylorus. In only two cases was there much liquid blood in the intestine.

"I have not observed the constant changes in the mucous membrane of the stomach described by Giles. The great variability in the number of anchylostoma found at the autopsies is interesting. In seven cases, all treated by thymol during life, no worms could be found. In an eighth case, also treated by thymol, but insufficiently, there were ten worms. The remaining eighteen cases had not had the advantages of thymol. Six of them, nevertheless, were found to have less than ten worms, and in two of these corpses only one worm was found in each jejunum. Three other cases numbered twenty, forty and fifty worms, but the remaining nine had numbers varying from 170 to 381, terminating with the maximum record of 863. On that occasion the autopsy was made seven hours after death, and the worms were scattered from a point one inch beyond the pylorus for the length of three meters; 217 of the 863 were attached still to the intestine and were surrounded by much bloody mucus, while 646 were lying free in the intestine; sixteen of the latter were still alive, and one couple were in copulation.

"Next the position of the worms deserves notice. It was quite the exception to find any parasites in the duodenum. Can it be that when the duodenum becomes thickened and riddled, as it were, with the ravages of former generations, the anchylostomum fastens by preference on to the jejunum? Some such cause as this sugges-

tion of gradually shifting the pasture is required to explain the interesting fact that it is not the most advanced cases of anæmia which will always yield the largest quantity of worms. In such cases the parasite must not only have to burrow extra deep, but the blood when reached is, of course, deficient in quantity. Or is it that the half-starved worms are dislodged by repeated attacks of diarrhea? The furthest feeding ground that I have seen was 6.3 meters from the pylorus, where there was a worm firmly attached.* But, as a rule, the attached worms are all within two meters of the pylorus, and have their heads and sometimes half their bodies buried in the mucous membrane. It is often impossible to dislodge them by a strong stream of water, and they must then be pulled out by forceps.

"I examined about fifty cases to see the proportion of male to female worms, and found it 56 to 44 per cent. This is not in accordance with some of the authorities, who say that males are always more rare than females, and that males are less influenced than females by the action of expellant drugs."

PREVENTION OF HOOKWORM DISEASE.

In the prevention of diseases caused by animal parasites, we may, of course, attempt to attack the infectious agent in any stage of its life history. In connection with uncinariasis, three periods in particular come into consideration, namely: (1) The adult worm in the intestine; (2) the egg in the feces, and (3) the infecting ("encysted") stage of the larva.

(*1*) *Adult Worm in the Intestine; Treatment.*

The destruction of the adult worm in the intestine not only relieves the patient of an important and (when present in large numbers) serious or even dangerous parasite, but it is also an important factor in preventing the spread of the disease to other

*"Dubini has only once seen the worm in the ileum. The nearest feeding ground seen by me was 24 centimeters from the pylorus. In that case there were 100 worms attached and 281 detached, besides oxyurides."

people. Accordingly, treatment should be instituted even if the eggs found in the feces are so few in number as to indicate only a light infection.

Not infrequently the opinion is expressed that the infection with parasites found in a given patient is so light that treatment is hardly necessary. Such a view, however, is often very shortsighted, for it is not infrequently light infections occurring at unfavorable seasons and under unfavorable conditions that furnish the material for heavy infections at more favorable times. No *Uncinaria* infection in man is too light to be worthy of treatment, for each adult female may lay eggs; hence the destruction of these females means the decrease of scores of free infectious larvæ.

Not all cases of the malady can be recognized without the microscope; hence many people will unconsciously spread the disease producing agent. Furthermore, many cases which might be recognized by symptoms will not come under medical treatment, so that they, too, will spread the infectious material. It is clear, therefore, that for satisfactory results in prevention we must adopt some method in addition to the treatment.

(2) *Eggs in the Feces; Control and Destruction.*

It is in the feces that we find the potentially infectious material in the most concentrated form. After the eggs develop into embryos the latter may leave the fecal matter and be distributed in the sand or in the water. Accordingly, it is much easier to control or destroy a given amount of infectious matter while it is concentrated in the feces than it is later when it is spread over a larger area. Here, in fact, we have the key to the prevention of uncinariasis. Proper disposal of the fecal discharges will make the spread of uncinariasis impossible. As such proper disposal I will suggest: Properly built privies when sewerage is lacking; use of such outhouses after construction; cleaning the same at regular intervals, and burial, burning, disinfection or drying of the feces.

(3) *The Infecting ("Encysted") Stage of the Larva.*

Disinfection of Premises.—A chemical disinfection of premises

to kill the free stages of eggs, embryos, and larvæ of the parasite would hardly be practicable, but heat, dryness and cold all result in killing these organisms.

About twenty-four to forty-eight hours of freezing temperature kills the free infection, hence after any cold weather of this kind in winter it may be assumed that the premises are disinfected.

After any especially dry weather, most if not all the free infection (except such as exists in places not affected by the dryness) is killed, so that exposed portions of premises may be assumed to be practically disinfected.

Spraying with burning oil (fig. 86), as practiced by the Massachusetts Gypsy Moth Commission, will effectually disinfect any area. If a spray nozzzle or "cyclone burner" is not at hand, the ground around the house could be strewn with straw or brush and set afire (due precaution being taken not to burn the house), thus thoroughly disinfecting the premises. (See Stiles, 1902d.)

Drinking Water.—To tell the average farm hand or miner that he should always "boil or filter" the water before drinking it is, academically, a step toward preventing infection with uncinariasis. Practically, however, it is a step toward throwing away whatever influence we may happen to have with him. Theoretically, we should teach this simple hygienic precaution to all families, both in the city and in the country. Practically, we are in many cases weakening our position by insisting too generally upon this point.

While, therefore, we may warn people to boil or filter their drinking water in order to prevent the introduction of the infecting agent of uncinariasis or of other diseases, provided we see any chance of their following the advice (in regard to which we ourselves, except in times of epidemics, are very inconsistent), we will, I believe, usually weaken our influence with the poorer classes in mentioning a precaution which the average farm hand naturally looks on as absurd. It is much more important to urge him to locate his privy some distance from the well. That is a proposition he can appreciate; the necessity for boiling or filtering drinking water is usually beyond his mental horizon.

Clean Hands.—An important point in connection with preventing the ingestion of the infectious agent of uncinariasis is that the hands and finger nails should be kept clean. I am inclined, however, to take an ultrapractical view of cleanliness versus dirt in connection with country houses, and to first see that the inevitable dirt shall be clean. This can be accomplished if we can succeed in having properly constructed latrines, built at proper distance from the wells and houses if the children be taught to use them, and if the parents be taught the necessity for cleaning them.

These, in my opinion, are the first teps to be taken, and far outweigh all such considerations as boiling and filtering drinking water or keeping the hands clean.

Wearing Shoes.—Wearing shoes during wet weather and washing the feet frequently will prevent the cutaneous infection and will protect to a great extent against grounditch. It can hardly be expected, however, that the poorer children in country districts will adopt this precaution to any extent.

COMMON INTERPRETATION OF HOOKWORM DISEASE.

Upon several former occasions I have referred to "cases of anæmia of obscure origin" as possibly due to uncinariasis. In a recent paper (Stiles, 1902b, pp. 207-208) I referred to "dirt-eating" as being possibly connected with uncinariasis; it was also intimated (1902b, p. 215), upon authority of Dr. Kirby-Smith, that in Mississippi uncinariasis is confused wth malaria; Harris (1902c) also points out that much of the anæmia attributed to malaria and dirt-eating is probably due to hookworm disease.

At present I am able to make more specific statements than formerly. The condition which should be attributed to light infections of uncinariasis is usually interpreted as due to malaria or diarrhea; medium cases are usually interpreted as an anæmia due to malaria combined with "improper diet" or "insufficient nourishment;" severe cases are usually attributed to "malarial cachexia," "dirt-eating," "resin chewing," "heart disease," "dropsy," "general debility," "pernicious anæmia," and "lack of proper nourishment."

Such at least are the most common diagnoses which have been made by the attending physicians in the cases which I have interpreted as light, medium, or severe infections with *Uncinaria americana.*

ECONOMIC IMPORTANCE OF HOOKWORM DISEASE.

Malaria is admittedly one of the most important diseases when viewed from an economic standpoint. In general, uncinariasis is, in the South, fully as important as malaria, and in some respects it is of even greater importance.

Take a given farming area in the sand district with an infection of uncinariasis, and assume that 100 farm hands are employed. It is not an exaggeration to say that these 100 people are not doing the work of 80 or 90 average hands. Thus there is a distinct loss of 10 to 20 per cent in the wages and a corresponding loss in the crop returns. In some places I should estimate the loss at even a higher percentage, say an average of 25 per cent, while in several families which I have examined I should say that uncinariasis is reducing the laboring capacity, hence the productiveness, of the family to as low as 30 to 40 per cent, thus entailing a loss of 60 to 70 per cent.

Nor are the losses in wages and in the laboring capacity, and the decrease of productiveness of the family, hence of the farm, and finally of the county and State, the only economic consideration involved. Cases are not unknown where families have sold, moved, or destroyed their homes, or were about to do so, because of the existence of this disease and because of the belief that it might be due to the locality in which they lived.

Again, it is almost a common experience to be told by the father of a family that he spends for medicine all he earns, in the hope of ridding his children of this malady. Add to this the physicians' bills, the loss by death and funeral expenses, etc., and it is seen that this infection is keeping more than one family in absolute poverty.

Nor should we forget that uncinariasis has its important bearing upon the mental as well as upon the physical and financial development of the poorer white people. As already stated, children

infected with this malady are often underdeveloped mentally; frequently they have a reputation in the schools, in the neighborhood, and in their own family, of being "stupid," or "dull," or "backward" in their studies, etc. It has already been mentioned that children suffering with this disease are frequently kept home from school because of their tendency to become edematous when they sit still for any length of time. When we now recall that these conditions coincide especially with the educational period, it should not seem strange that uncinariasis has a marked influence upon the general intellectual condition of the districts in which it occurs.

Considering the subject in the light of all I saw on the trip, and taking what I believe to be a conservative view of the subject, I find it exceedingly difficult to escape the conclusion that in uncinariasis, caused by *Uncinaria americana,* we have a pathologic basis as one of the most important factors in the inferior mental, physical and financial condition of the poorer classes of the white population of the rural sand and piney wood districts which I visited. This sounds like an extreme statement, but it is based upon extreme facts.

By this position I do not intend to assert that uncinariasis is the only factor which comes into consideration. The warm climate and the monotonous diet, and probably also the excessive use of tobacco in some cases, are not without influence. Still, with uncinariasis as it exists today, these people are suffering from a handicap in life which practically removes them from a fair chance in competition. If the uncinariasis is removed they will be placed in a more favorable condition, both subjectively and objectively. With the present prevalence of uncinariasis their lack of ambition is perfectly natural; remove the disease and they can develop ambition.

On the other hand, if we were to select the strongest people in the country and place them in the conditions under which these patients are now living it would be only a generation or two before even a race of athletes would be in the same condition as the persons under discussion.

The conditions described are familiar to persons who have visited

the rural sand districts. But they have existed for so many years that many of us today look upon them as natural, hence they do not attract the consideration to which they are entitled.

SPECIAL CONDITIONS IN TEXAS.

In reference to hookworm disease, Texas occupies a position which is slightly different from the relations met with in the Southern Atlantic States. In your State you will have to deal not only with the cases already existing within your borders, but undoubtedly many of the Mexicans who immigrate here will bring new infection with them. Hence it will be more difficult to free Texas from uncinariasis than it will be to eradicate the disease from States like Georgia and Alabama.

In conclusion, I wish to acknowledge my high appreciation of the importance of the observations which have been made by a member of your Association, namely, Dr. Allen J. Smith. I do not feel that his work has been sufficiently recognized by the medical profession. He has worked under trying circumstances, but has rendered splendid service, not only to Texas, but to the country at large, in connection with this disease.

DISCUSSION.

DR. H. A. WEST, Galveston: I am sure that I voice the sentiments of this entire body when I express my high appreciation for the paper just read by Dr. Stiles; we feel that if we had heard nothing else here we would have been amply paid.

There are several points which have suggested themselves to me in listening to the paper, to which I now wish to direct attention. In the first place, in regard to the proportion of hookworm disease to that of malaria. I understood Dr. Stiles to say that he was confident that there were as many cases of hookworm disease in the South as of malaria. Without further knowledge on the subject, I am not willing to accept this statement. I am hardly in a position to realize that hookworm disease is as widely distributed as malaria. If the statement had been that there were as many cases of hookworm disease as there were of chronic malarial fever, then I might have accepted it.

Another point I wish to mention, that is the large proportion of cases occurring in orphan asylums and other eleemosynary institutions, the idea

has suggested itself to me as to the probability of the predisposition being brought about by the deprivations and unhygienic conditions and surroundings of the inhabitants of such institutions, and whether the reduced resisting powers of the individual may not have something to do with the excessive number of cases under such circumstances.

In regard to the symptom of perverted taste, I had a case recently in Galveston, which I suspicioned merely on account of this symptom. This patient had many of the symptoms mentioned by Dr. Stiles, with a craving for a certain kind of clay, i. e., that which is found in the old-fashioned chimneys in the country. This craving for this clay was so great that he had written to his brother to have some of it sent to him by express.

DR. WM. KEILLER: Our cases of uncinaria are exactly similar to those discussed by Dr. Stiles, and investigated by Dr. Smith of Galveston. These cases that Dr. Smith investigated were the students in the University, and they came from all over Texas, so that none of them originated in Galveston.

DR. WALTER SHROPSHIRE, Yoakum: I beg to differ with Dr. Stiles in regard to malaria and the hookworm disease. I do not think he should put it so strong as to say that almost every other case discovered in Texas was hookworm disease and not malaria; that our chronic cases of malaria in many instances were due to hookworm disease, and that there was more hookworm disease than malaria in Texas. While I have seen over 2000 cases of malaria, and of these cases I have seen cases where the hookworm could not be found after repeated trials, and where the proper treatment for malaria was given they got well; other cases I have seen where the symptoms did not abate on adequate anti-malarial treatment were none, hence must have been malaria, and they were in sandy soils as well as clay districts. His conclusion, that hookworm disease is confined to sandy districts, is possibly due to the fact that his examinations were in sandy soils of Georgia and Alabama and the older States, where, on the poor sandy lands, poverty is more prevalent, and want of cleanliness more common, and in that class of people who are not clean and are more liable to be infected than the cleaner or higher class of people who live on the richer clay and black soils. The habits of dirt eating and life of the lower order of mankind, such as are found in those poor sandy districts, predisposes them to infection, and this may account for his finding the disease most commonly in the sandy districts, while we, who treat a cleaner class of people even on sandy soil, do not find the disease so prevalent.

I think it is an overdrawn conclusion, to believe that half of our cases of malaria are in reality hookworm disease, even in those chronic cases that seem, for a time, to resist anti-malarial treatment.

DR. JOHN T. MOORE, Galveston: I had the pleasure of going over the map prepared by Dr. Smith, and seeing the distribution of the parasite in Texas. As well as I remember, the cases are confined largely to the river basins, and our river basins are made up of sandy loam. This would correspond to what Dr. Stiles has spoken of in reference to sandy districts.

Dr. Stiles' observations, of course, are confined to Florida, the Carolinas, Alabama and Georgia, where, I understand, there is a great deal of poverty. I have been over a large part of Alabama, Georgia, and a part of Mississippi, where poverty exists, as referred to by Dr. Stiles. It exists mostly in the barren regions, that is, where the soil is sandy and quite poor. I have been through the section of Georgia where there is a sandy soil, covered by pine and wire grass.

I remember to have seen these typical cases that Dr. Stiles has spoken about. I saw them in 1882, in East Texas, and heard them spoken of as chronic malarial fever. They seemed to suffer a great deal. As I traveled through Polk and Tyler counties, in these sandy regions I saw many of these children with distended abdomens and swollen limbs. Those of you who had lived in that section can recall some of those cases now.

I think that Dr. Stiles' work in this regard is one of the most important contributions to medicine that has appeared in recent years. It may be compared to that of Ross, who has given us such a valuable contribution on *malaria*.

I was glad to hear Dr. Stiles pay this tribute to Dr. Smith in regard to his work, which was entirely independent of any other person. Dr. Smith, in the routine examination of stools in class examination, found these parasites; then he systematically took the stools of the different students, until those infected were located. I do not know anything about the markings on the tongue, that are said to be diagnostic of this disease.

I had an opportunity to study the case of which Dr. Keiller spoke. His name was Somerville, and he was a patient in the Marine Service at St. Mary's Infirmary. I have studied two other cases, one in the ward of the Sealy Hospital, another a railway case of a Mexican, that I saw last summer, but they were not as typical in appearance as those spoken of by Dr. Stiles as those of the severe type.

I think it was the intention of Dr. Stiles to limit his remarks to the infected districts. If we include the whole of our southern territory, and say that half of our cases diagnosed malaria will really be found to be hookworm disease, I am not ready to accept that, but there are exceptions to this illustrated: if we consider those cases of chronic malarial fever that will not yield to treatment, I think a large percentage of these are due to the hookworm. I have thought that probably the infection is gotten by many of the Mexicans who work in the brick yards in the western part

of the State, especially where they make the brick by hand. They get into the mortar with their bare feet and mix it up, then take the mortar up in their hands and place it in the moulds. If the infection is gotten through the skin, it it thus easily explained. Many of the Mexicans that I have seen in Western Texas have this pot-bellied appearance. They are certainly as lazy, too, as any of Dr. Stiles' cases of Florida and Georgia.

Drs. Smith and Stiles are pioneers in this line, and I look forward with pleasure to hearing them discuss the subject together at New Orleans.

DR. H. W. CROUSE, Victoria: Dr. Stiles' inherent modesty has prevented him from repeating the statement that he made three years ago, namely: that it would be conclusively proven that uncinariasis existed not only in Texas, but throughout the southern portion of the United States. I think this is one of the prettiest demonstrations of a scientific theory now well proven to be true, that I have any knowledge of. Dr. Shropshire states that he has never come in contact with a case. I believe that this statement can be readily proven to be fallacious. My reasons for making this remark is because I have come in contact with a case from Runge, and have met another case in Victoria. You draw a line from Runge to Victoria, and you will pass through Dr. Shropshire's home, Yoakum; so that it seems rather strange, indeed, that we should have an isolated case at these points without any cases existing intermediately. It conclusively proves, to my mind, a well known fact that we physicians only too frequently neglect to utilize the opportunities which present themselves at various times to clear up our cases by microscopical examination of the stools and the various excretions of the body. Should we do so, we would be able to account for many of our obscure symptoms, and readily decide the true condition existing.

DR. BETHEL NOWLIN, Jonah: I have been familiar with these cases all my life, but never knew what was the matter with them. I always heard them called dirt eaters; a name that was always an insult to the patient.

Some of the patients would eat sand, some clay, some chalk, or pine bark, or anything that was trashy. Dr. Shropshire suggested, as it was found only in the sand districts, and among the very poor, that may be their poor living was responsible for their habits and disease.

I was born and raised in Tyler county, near line of Polk, where Dr. Moore mentioned finding the disease so frequent, and I remember it was found in the best families, who live far better than the average families do on the black land belt, where the disease is hardly seen at all.

In Williamson county it is very seldom seen, only as it comes from East Texas. We have a merchant in my town, an energetic, prosperous fellow, whom I treated for this disease when a boy. When I go home, I will tell him what was the matter with him.

DR. J. M. NICKS, Stone City: I am heartily glad that I attended this meeting, and heard Dr. Stiles' paper. The fact is, I am learning. I have had several persons in my practice who ate dirt, and I did not really know what was the matter with them. I have two cases where I am now practicing medicine, two negro women, one a light mulatto, the other is dark; the latter has the typical form of that picture we saw on the screen. If she has hookworm disease now, she must have contracted the disease in her mature years. She says that when the inclination comes to eat dirt, she will go to a certain place on the bank of the river and procure an apron full of dirt, take it home, put it in the chimney to dry well, where it will take on a peculiar flavor from the soot. She says the soot becomes rather thick on this clay and gives it a much better flavor than the undried clay has. She informed me of this peculiar condition two or three times, and asked me to treat her for this disease. She lives on a farm, where I get orders to see other cases, and I have paid no attention to her. I have often thought, for my own satisfaction, to make an investigation of her case, to see if I could find out whether or not she is a victim of hookworm disease. I think now, when I return home, I shall make an investigation.

DR. CHAS. WARDELL STILES, M. H. S., Washington, D. C.: In closing this discussion, I would reply to the gentlemen as follows:

1. The relation of this disease to sandy soil is not imaginary. I do not mean to state that it is *confined* to sandy soil, but that it is *pre-eminently* a disease of the sandy regions.

2. In saying that uncinariasis is so common "in the country," I see that my expression has been misunderstood. I do not claim that uncinariasis is as common in the country at large, namely: in the United States, as is malaria. What I meant to say is that in the *country districts* (as distinguished from the *cities*) of the Southern Atlantic States, which I visited, I found uncinariasis as common as I did malaria. Again, twenty-five per cent of the Charleston medical students, whom I examined, showed infection with hookworms. I, of course, do not extend my conclusions to any part of the South or North except those localities which either I or some other persons have examined in reference to this point.

3. The markings on the tongue have been assumed to be a newly recognized symptom, and it seems to be a fact that they have only recently been recognized in connection with uncinariasis. But clay-eating frequently represents the extreme stage of hookworm disease, and these markings on the tongue of clay-eaters seem to have been recognized years ago.

4. The blotting paper test must not be relied upon too much. Some of the severe cases fail to give the peculiar stain which I have seen a number of times, but it is a convenient test for some cases. It is best, of course, to use it simply as a secondary test, and to rely upon the microscope.

5. Blood is undoubtedly occasionally present in the stools, but is by no means a constant symptom.

6. The adult worms are occasionally passed in the stools, even before a thymol is administered, but this is the exception.

7. As for the systematic position of the American parasite, it is undoubtedly a member of the hookworm group of round worms, but I believe it will eventually be recognized as the type of a distinct genus, or at least of a distinct sub-genus.

THE TUBERCULIN TEST IN THE DIAGNOSIS OF TUBERCULOSIS IN MAN.

BOYD CORNICK, M. D.,

SAN ANGELO, TEXAS.

Time was, and not so very long ago, when pulmonary tuberculosis and pulmonary consumption, or phthisis, were synonymous terms, used indifferently, and without discriminating the stage of the pathologic process. The treatment was empirical, or purely symptomatic. The prognosis was essentially unfavorable, and there seemed to be no particular reason for differentiating between the early and more advanced stages of a practically hopeless disease. Of late years, however, it is coming to be an accepted teaching, by those of widest experience, that no other chronic disease is so readily curable as tuberculosis, if taken in the earlier stages, before the body tissues are too widely invaded, and before a mixed infection with various other pathogenic germs has been superimposed upon tuberculosis, pure and simple. If this doctrine, after making due allowance for the possible over enthusiasm of its advocates, be accepted as only half true, then the recognition of a tuberculous infection at the earliest practicable moment stands out as a matter of pre-eminent—nay, of vital—importance to the individual patient. At this early period of the infection, not only may the best available therapeutic measures be adopted for the cure of the individual —measures which, in the aggregate, are universally accepted as productive of the best results—measures hygienic, dietetic, climatic, and, if you will, specific; but, at the same time, that curative measures are instituted for the welfare of the individual, the proverbial ounce of prevention, which is of even more importance to society at large, may at an effective period have it due weight and multiplied value.

Before the illuminating genius of Robert Koch had identified

under the microscope the bacillus tuberculosis as the efficient and sole exciting cause of tuberculous processes, the whole subject was shrouded in a haze of uncertainty and doubt. Laboratory cultures and animal inoculation verified his claim that tuberculosis was a germ disease, and therefore infectious. The deduction followed logically of course, that, being infectious, it was also preventable. The microscopic recognition of a bacterium, as the exciting cause of tuberculosis, at once clarified our diagnostic vision in the recognition of its manifold manifestations, and broadened our views as to the nature of many theretofore doubtful pathologic processes. But in the diagnosis of bone and joint tuberculosis, of glandular and cutaneous involvements, the surgical removal of affected tissues must often be resorted to before the microscope becomes an available diagnostic means; while, in suspected pulmonary tuberculosis, if we wait till ulceration and breaking down of tissues shall liberate the bacilli in order to make a certain diagnosis, we may have missed the golden opportunity, and find that we can no longer take the therapeutic stitch in time. Hence it must be admitted, without further question, that the finding of tubercle bacilli in the sputum with the microscope may never rightly be called an early stage diagnosis, though, as a check on other diagnostic measures, it should never be omitted.

On August 4, 1890, eight years after his memorable discovery of the tubercle bacillus, Koch stated, at a general meeting of the International Medical Congress at Berlin, that he had, as a result of prolonged research, found a substance which, when inoculated into a guinea pig renders it incapable of reacting to the inocluation of the tubercular virus. (Fowler and Godlee, *Diseases of the Lungs,* p. 396.) In other words, this substance produced immunity to tuberculosis in guinea pigs. On November 13, 1890, Koch published the results observed to follow the administration of this substance both in tuberculous and non-tuberculous human beings. (*Deutsche Med. Wochenschr.,* No. 46a.) It was asserted that the substance in question, for a time known as Koch's lymph, later known as tuberculin, possessed distinct curative properties in tuber-

culous processes in man, and that, quite aside from its therapeutic virtues, it developed, when administered subcutaneously to any tuberculous individual, a characteristic reaction, both general and local, and that this reaction of the tuberculin was diagnostic of the existence of the tuberculous infection. Koch's original tuberculin, also called crude tuberculin, is a sterilized glycerine extract, made from pure cultures of human tubercle bacilli. In the course of his experimentation, Koch administered to himself, what we now recognize as an enormous dose of tuberculin, 250 milligrams, and suffered severe temporary discomfort in consequence. He reports the symptoms experienced in his own person as follows:

"Three to four hours after the injection, pains in the limbs, weakness, an inclination to cough, difficult breathing, which rapidly increased. In the fifth hour an exceptionally hard chill developed, which lasted nearly an hour: at the same time nausea, vomiting, rise of bodily temperature to 39.6 degrees centigrade (103.3 F.). After about twelve hours all discomfort moderated, temperature declined, and fell to normal by the following day. A heavy feeling in the limbs and weakness lasted for several days, and for the same period the site of the injection remained somewhat painful and red."

He reported on the basis of numerous tests that the smallest quantity of the substance which would produce appreciable symptoms in a healthy person was in the neighborhood of ten milligrams, equivalent to one cubic centimeter (or fifteen and a half minims) of the one per cent dilution. Most non-tuberculous individuals reacted from this dose only with a slight aching in the limbs and evanescent weakness. Some, however, developed a slight rise of temperature also, up to 38 c. (100.4 F.), or a little higher.

Koch had found that healthy guinea pigs could tolerate a dose of 2000 milligrams, and even more, of the undiluted tuberculin, without being perceptibly affected thereby, while 250 milligrams produced in a healthy man a profound effect. So that, calculating by bodily weight, the 1-1500 part of the dose which produced no appreciable effect on the guinea pig, had a most profound effect on

man. "But," to quote further from his report, * * * "if a marked difference exists between experiment animal and man with reference to the dosage of the substance, when calculated by bodily weight, there appears on the other hand a marked similarity in certain other respects. The most important of these peculiarities is the specific action of the substance on tuberculous processes of whatever character they may be. I will not further describe here," he goes on to say, "the results as to test animals, as that would lead me too far; but will turn at once to the very remarkable effects on tuberculous men. The healthy man, as we have seen, either does not react at all from a dose of ten milligrams, or does so in an insignificant manner. Exactly the same holds good for the sick men also, as shown by numerous tests; provided, they are not tuberculous. But an entirely different state of affairs develops with the tuberculous. The same dose of the remdy (10 milligrams) injected into these is followed by both a strong general and local reaction."

At this point a foot note states: "We have administered a tenth of this dose, namely, one milligram, to children of from three to five years; and to very delicate children only a half milligram, getting therefrom pronounced but not an alarming reaction.

"The general reaction consists in an attack of fever which, usually beginning with a chill, raises the bodily temperature above 39 degrees centigrade (102.2 F.), often to 40 c. (104 F.), and even as high as 41 c. (105.8 F.). At the same time occur pains in the limbs, inclination to cough, great weakness, often nausea and vomiting. The onset begins, as a rule, four to five hours after the injection and continues twelve to fifteen hours. Exceptionally it can develop later, and runs its course then with lesser intensity. The sick are remarkably little depressed by the attack, and feel relatively well so soon as it has subsided, indeed, as a rule, better than before."

It is worthy of mention at this point, that the excessive febrile reactions reported in Professor Koch's original paper, as sometimes occurring, are not necessary to establish the diagnosis, and

should be avoided by beginning with a smaller dose than that at first recommended. A rise of two degrees, usually reached in from twelve to twenty-four hours after the injection, is considered diagnostic. Arthur Latham holds that a rise of one degree Fahrenheit, following the administration of one milligram, may be considered a positive reaction, even when delayed under exceptional circumstances for thirty-six hours. (Latham, *Pulmonary Consumption*, p. 29.)

But let us return to Koch's original report:

"The local reaction may be better observed in those patients whose tuberculous affection is visible to the eye; for example, in cases of lupus. In these cases changes take place which show the specific antituberculous action of the remedy in a most astonishing way. Some hours after the injection has been made, subcutaneously in the back, at a point quite remote therefore from the site of the involvement, whether it be of the skin of the face or elsewhere, and usually, too, before the chilliness commences, the lupus spots begin to swell and turn red. During the fever the swelling and redness continue to increase, and may finally reach so pronounced a stage that the lupus tissue becomes in some places a brownish red and necrotic. In cases of sharply defined lupus deposits, the strongly swollen and brownish red colored spot was often fenced in by a whitish ring, of nearly a centimeter in breadth, which in its turn was surrounded by a broad and bright red area. After decline of the fever, the swelling of the lupus patches gradually diminishes, so that after two or three days it may have vanished. The lupus nodules themselves are covered with a crust from exuding serum, drying in the air: these transform themselves into scabs, which, after two or three weeks, fall off, and, sometimes after only a single injection of the remedy, leave behind a smooth, red scar. Generally, however, several injections are necessary for the complete removal of the lupus tissues; but of that more anon. As being of special importance in this process, emphasis must be laid on the fact that the changes described are limited strictly to the areas of skin involved by the lupus. Even the smallest and least evident

nodules hidden in the scar-tissue, undergo this process and become visible, by reason of the swelling and change of color; while the scar-tissues proper, in which the lupus changes have run their course and entirely subsided, remain unaffected.

"The observation of a case of lupus treated with the remedy is so instructive, and must at the same time prove so convincing, with regard to the specific nature of the remedy, that every one who wishes to practically investigate the remedy should begin his tests, if it be at all possible, with cases of lupus.

"Less striking, but perceptible enough to eye and touch, are the local reactions in tuberculosis of the lymph glands, of the bones and joints, etc., in which cases swelling, increased pain, and, in superficial areas, redness also are observable. The reaction in the internal organs, on the other hand, for example in the lungs, is withdrawn from our observation, unless one would refer a possibly increased cough and expectoration on the part of the pulmonary patient, following the first injections to a local reaction. In such cases the general reaction predominates. Nevertheless, one must assume that here, too, like changes occur as those directly observed in lupus."

Supplementary to the foregoing quotations from Professor Koch's paper, I may add that a local reaction over a circumscribed area of the lungs is commonly recognized by careful auscultation as following the administration of a suitable quantity of tuberculin in cases of pulmonary tuberculosis and, in the experience of capable clinicians, is conclusive as evidence of a local deposit even when the general reaction following a small dose, when considered by itself, would be too slight for a positive determination of the matter. But let us continue our translation, for in the next paragraph Koch states his convictions as to the diagnostic value of his tuberculin in the following clear-cut summary:

"In the tests thus far made, the above described evidences of reaction have occurred, without exception, after the administration of ten milligrams, whenever any character of tuberculous process was present in the body, and I believe, therefore, I am not going

too far when I assume that the substance will prove an indespensable aid to diagnosis. By its help one will be in position to diagnosticate doubtful cases of beginning phthisis, even at the stage when it is impossible to determine the nature of the ailment either by finding bacilli or elastic fibers in the sputum, or by physical examination. Glandular involvements, concealed bone tuberculosis, uncertain skin tuberculosis, and such like affections, will be easily and surely recognized as such. In cases of pulmonary and joint tuberculosis, which have apparently progressed to recovery, it will be practicable to establish whether the disease process has really terminated, or whether some scattered deposits yet exist, from which, like a smouldering spark in a bed of ashes, the disease might later develop renewed activity."

Professor Koch then goes on to say:

"Very much more important, however, than its diagnostic significance, is its curative action;" but that is another topic, which was not assigned me today, and would lead us too far from the subject in hand.

THE METHOD OF ADMINISTRATION.

The method of administration of the tuberculin which Professor Koch adopted was by subcutaneous injection. It gave no results when administered by the stomach. The site selected for the needle puncture, after some trials of other localities, was the skin of the back between the shoulder blades, or in the loin, because the injection in these regions gave least local soreness, usually none, and was almost free from pain.

THE COMPOSITION.

The composition of his remedy (which is a sterilized glycerine extract of a culture of human tubercle bacilli) and the mode of its preparation were reserved for a later communication, since his work had not yet been completed, but in this first report he tells in detail how it looks, and how to use it:

"The remedy consists of a brownish clear fluid, which keeps

without special precautions. For use this fluid must be more or less diluted, but the dilutions decompose if made with distilled water. To prevent this, the dilutions must be sterilized by heat and preserved under a seal of cotton wool, or, what is more convenient, made with 0.5 per cent solution of carbolic acid. Whether by repeated sterilization with heat or by the mixture with carbolic acid solution, the very dilute solutions appear to lose their strength after a time, and I have therefore always used solutions as freshly made as possible."

This seems a fitting place to clearly fix the dosage of the diluted tuberculin for those unused to the employment of the metric system. The full limit of ten milligrams, originally recommended for diagnostic use in adults, may be best measured by one cubic centimeter (fifteen and a half minims) of a 1 per cent solution, or by one and a half minims of a 10 per cent solution. The full dose of one milligram, recommended for a child, would therefore be one and a half minims of a 1 per cent solution. Since Koch's original publication of his method of using the remedy for diagnostic purposes, it has been extensively used by a number of clinicians who, with a few exceptions, agree on certain modifications of the dosage. For example most of them recommend, to begin with, one to three milligrams to adults, and if no reaction occurs, double the dose each day or every other day, till twenty or thirty milligrams are given at a single dose. Others prefer to begin with five milligrams —selecting only those cases in which the diagnosis by other means can not with certainty be made—and if no reaction follow, then double the dose once, and if necessary twice, before reaching a definite decision. At the British Congress of Tuberculosis, held at London in July, 1901, Professor Koch is quoted (*Journal of American Medical Association,* August 10, 1901, p. 384) as saying that:

"The injections should be small enough; in weak patients one-tenth of a milligram was enough to begin with, and no second injection should be given until the temperature was again normal. When the first injection gave a faint reaction, a second injection of

the same quantity frequently or indeed generally gave a very marked reaction."

AS TO THE RELIABILITY OF THE TUBERCULIN TEST.

As to the reliability of the tuberculin test, Koch's first report, as quoted above, would indicate that he thought it practically infallible if the single test dose of ten milligrams were administered; but that there is nothing absolutely infallible in medicine, we have all of us learned, who have had even a brief experience. Koch is quoted ten years later by Karl Von Ruch (*Journal of Tuberculosis*, July, 1900, p. 361) as having stated that to really exclude tuberculosis, a patient must show no reaction to a full test dose of twenty milligrams. In July, 1901, he stated at the British Congress (loc. cit.) that over 3000 cases had come under his own observation, and from the study of these he had come to the conclusion that as a diagnostic test, tuberculin was almost absolute.

It is a remarkable fact that while the general reaction is usually pronounced in incipient cases, which are febrile or only slightly febrile, it *may* be entirely absent following ordinary full test doses in cases of advanced phthisis, whether progressive or of the stationary fibroid type. This is accounted for on the hypothesis that such cases acquire a certain immunity by the absorption of like toxins from existing tuberculosis deposits to those contained in the tuberculin. But in these chronic cases the diagnosis may usually be established by other means.

An observation of considerable importance has recently been made by Clement A. Penrose, of Baltimore, who reports (*Journal of Tuberculosis*, October, 1902) that tuberculin prepared from cultures of bovine bacilli produces a decidedly more pronounced febrile reaction in man than does Koch's original tuberculin, which was, and is yet, prepared from cultures of bacilli of human origin. It may be that the use of a bacillary product from bovine sources will in future eliminate an appreciable margin of error inherent in the tuberculin hitherto available.

Until recently the reliability of a febrile reaction following a

test dose of tuberculin was assailed on the ground that syphilis and actinomycosis, may afford a similar reaction to that met with in tuberculosis. But in such a case of actinomycosis of the liver, reacting to tuberculin, which occurred in the Leipsic surgical clinic, a tuberculous deposit in the lung was demonstrated *post mortem.* (Quoted by F. Frenkel in the *Zeitschrift für Tuberculose u. Heilstetten wesen,* 1900. Bd. 1, from the *Zeitschrift für Chirurgie,* 1896. Bd. XLIII.) And it was asserted positively by Heron (Proceedings London conference loc. cit.) that he had never seen a reaction to tuberculin in a syphilitic patient not suffering from tuberculosis. Enslin (*Deutsche Med. Wochenschrift,* 1903, XXIX 9; Abstr. *Journal American Medical Association,* April 4, 1903, p. 944) differentiates between tuberculous and syphilitic parenchymatous keratitis by the absence of a febrile reaction in syphilitic cases, unless complicated by tuberculosis. It is worthy of note that the eight cases of associated tuberculosis and lues reported by Enslin gave a temperature reaction which was characterized by a steep rise and a steep decline. This occurred in two cases after one milligram of tuberculin; in five after injection of one milligram; in one after three milligrams.

The very wide experience obtained from the use of tuberculin in testing cattle for tuberculosis, has demonstrated that in apparently healthy animals, if a definite reaction occur, there will be found somewhere in the carcass—in a lymph gland, perhaps, if the lungs and udder be found normal—a tuberculous deposit, *if only a sufficiently minute and careful examination be had.* And in the human subject it is coming to be generally accepted that a definite reaction, following the administration of ten milligrams or less, is conclusive of the existence of tuberculosis. The margin of possible error appears to lie in the occasional failure of a tuberculous individual to afford a typical reaction to any reasonable dose. Of such failure to react, in a case which later proved tuberculous, I have met with one definite instance.

As to the possibility of danger from the use of tuberculin for diagnostic purposes, the opinion of those who have used it most

extensively, that it is safe when rationally administered in early stages of tuberculosis, when a diagnosis can not be made with certainty by other means should outweigh the fears of others who either have not used it or whose apprehensions are based on the harm which it unquestionably did, when administered twelve years ago in excessive quantities, and to unsuited cases of phthisis with mixed infection. As a therapeutic agent, Professor Strümpell, in his work on the *Practice of Medicine*, while opposed to its use as a remedy *for the treatment* of tuberculosis, commends it, though somewhat guardedly, as a diagnostic agent; and Osler and Anders on this side of the Atlantic both advocate it, and rely upon it in the differentiation of otherwise doubtful cases. Like chloroform, strychnine and other powerful agents, its dosage must be carefully adjusted to the case in hand. Like Vidal's reaction in typhoid fever, it may not be regarded as infallible; but in those cases, and at those stages of tuberculous involvement where other means of diagnosis fail us, we may rely upon tuberculin for an unequivocal reaction and a definite diagnosis in from 93 to 98 per cent of our cases.

DISCUSSION.

DR. H. W. CROUSE, Victoria: Personally, I am afraid of this test; I would not permit it to be used on myself. I believe, from the statement that the doctor has made, that at times a latent case of tuberculosis will develop into an acute case, which may terminate, in all probability, fatally. Anderson, one of the greatest enthusiasts upon the tuberculin test, admits that ten per cent of the cases in which it was used, where a latent condition existed, developed acute tuberculosis; that in ten per cent, where tuberculosis was known to exist, it failed to give any reaction at all; that in the remainder of eighty per cent, it was of benefit. I believe, gentlemen, that we should let a number of our cases alone, and, at least, should not use a remedy that is liable to change a dormant case into an active one. It is well known that frequently, in chronic cases, the bacilli are lying dormant in the peri-lymph spaces, which no doubt would be stimulated into activity by the use of the tuberculin. Dr. Cornick states that in lupus he has observed a reddening and an acute inflammation to take place, showing that the remedy stimulates the dormant bacilli, that all the classical signs of a vicious cycle under the stimulus of this test takes place. If such exists upon the surface, where one can readily observe it,

we are led to believe, by analogy, that the same, in all probability, occurs in the lung. He further proves this point by showing that he was able to outline small cavities in the lungs, previously unable to be discovered, after the use of tuberculin, and that in fibroid condition of the tuberculosis he had been able to outline classical signs of cavities after the test. I wish to state that I think a great deal of Dr. Cornick, and value his opinion very highly, but I have a fear, notwithstanding, of the tuberculin, namely: on account of Anderson and other authorities, and the paper which so beautifully summarized the literature upon the subject my friend just read, in which he proves that an acute case may develop from a dormant type of tuberculosis, terminating fatally, after the use of the tuberculin.

THE CLIMATE OF FORT DAVIS, TEXAS.

W. T. JONES, M. D.,

FORT DAVIS, TEXAS.

Having been solicited by the Chairman and Secretary of the Section on State Medicine and Public Hygiene to prepare a paper upon the Climate of Fort Davis, especially as regards tuberculosis, for this meeting of the State Medical Association, I will endeavor to do so, basing my remarks upon personal observation, after a residence of about three years in said locality.

I will preface the paper by saying that I have no "ax to grind"—no sanatorium for the treatment of tuberculosis patients, and therefore believe I can give an honest and truthful opinion as to the merits of the climate.

I believe it is now generally admitted by a great majority of specialists in lung diseases, especially tuberculosis of the lungs, that a moderately high altitude that is dry, and changes of temperature not too great or sudden, is the ideal climate for such patients. As an evidence of this fact the United States government has established an army hospital and sanatorium for the treatment of pulmonary tuberculosis at Fort Bayard, N. M., where the altitude is 6,040 feet.

Fort Davis, the county seat of Jeff Davis county, is the site of a former United States military post. It is located at the foot of the Davis mountains, 5,200 feet above the sea level. Surrounding mountains are 6,000 to 9,000 feet above the sea. It is twenty-two miles north of Marfa, on the Southern Pacific railroad, and has daily stage over an excellent road. The soil is gravelly and exceedingly porous, hence there is good drainage, and no mud, even after heavy rains. The rainy season is from July to October—not continuous rains and cloudy days, but occasional showers that cool the atmosphere, which makes it the ideal summer resort. The

village is so well protected on the north and west by mountains that it does not suffer from northers and high west winds that prevail during the months of February and March. While the thermometer sometimes gets as low as zero during winter, the situation as above described, and the exceedingly dry atmosphere, make the place a pleasant and desirable winter resort for tuberculosis patients. I have frequently had patients tell me that they suffered less from cold here during the winter than in Southern Texas, which is my own experience. The water is as good as can be found in Texas, being supplied by wells at from forty to eighty feet deep, and from springs. The summers are exceedingly pleasant, the nights being delightfully cool. There are no mosquitoes and absolutely no malaria. The atmosphere is so pure and dry that the bodies of dead animals do not decompose in the usual way, but dry up on the plains.

I submit an official statement as to the variation between mean summer and mean winter temperature at some of the most noted resorts in the world.

	Degrees.
Denver, Colo.	25
Pensacola, Fla.	20 7/10
Columbia, Aiken and Augusta	22 6/10
Asheville, N. C.	23
Venice, Italy	35
Bordeaux, France	29
Florence, Italy	31
Genoa, Italy	28
Paso, France	20 7/10
San Diego	24
Fort Davis, Texas	18 7/10

Average number of cloudy days during winter months, United States signal service reports:

Augusta and Aiken	34
Denver, Colo.	7
Los Angeles, Cal.	10

Mobile, Ala.	33
Asheville, N. C.	20
San Diego	10
Jacksonville, Fla.	26
Pensacola, Fla.	30
Harrogate	32
Fort Davis, Texas, only	5

The mean relative humidity as per United States signal service reports is:

	Per Cent C.
Augusta and Aiken	77
Denver, Colo.	53
Harrogate	74
Los Angeles, Cal.	74
Mobile, Ala.	79
San Antonio, Texas	66
San Diego, Cal.	72
Asheville, N. C.	64
Fort Davis, Texas	33

The above reports show that Fort Davis has the most favorable climate for persons suffering from lung diseases. It has the smallest range of temperature, most porous soil, fewest cloudy days, dryest air, requisite altitude, and pure drinking water. I can not learn of a single case of tuberculosis ever having originated in the vicinity of Fort Davis.

Now, as to the cases of tuberculosis and other diseases most benefited by the climate. It is a well known fact that the earlier in its development tuberculosis is recognized, sent to a suitable climate, under proper restraints and appropriate treatment, the better the chances are for recovery. I am fully convinced that a large per cent of tuberculosis patients, if sent to West Texas when the disease is in its incipiency, would recover, provided they were placed under proper care and treatment, and remain a sufficient length of time. Unfortunately a number of such patients become discouraged and homesick because they do not recover in a few

weeks' time, or improve as rapidly as they wish. There are cases in which several months will sometimes elapse before there is any perceptible improvement. There is at present a young lady in Fort Davis who came from southern Texas nearly two years ago with a well defined case of incipient tuberculosis of lungs, having high evening temperature, night sweats, distressing coughs and rapidly losing flesh. Examination of sputum showed abundant tubercle bacilli. These symptoms persisted, with intervals of slight improvement, for eight or ten months before there was any decided change for the better. She has had no elevation of temperature for nearly one year, coughs but little, very few bacilli in sputum, and now weighs 162 pounds—more than she ever weighed. My own experience is not in conformity to the generally accepted opinion in the profession that high altitudes are not suitable to hemorrhagic cases of tuberculosis. I have seen several cases that were having frequent hemorrhages before coming to this climate, which at once became less and finally ceased altogether. Dr. D. M. Appel, surgeon in charge of the United States hospital for tuberculosis soldiers at Fort Bayard, N. M., says upon the subject:

"Further experience confirms my statement of two years ago, that hemoptysis occurs much less frequently than at lower altitudes. Nearly fifty per cent of our cases have a previous history of hemorrhages, and in many it has occurred very recently before admission. In a very few has there been a recurrence, and when recurring it has been readily controlled, excepting in those with large excavations."

Fort Bayard is 6040 feet above the sea level—840 feet higher than Fort Davis. I believe that even advanced cases of tuberculosis would be materially benefited and life prolonged in this climate, if they could be placed under proper restraints and care, otherwise they had better remain at home among friends and relatives, who will comfort and soothe them to the inevitable end.

A very grave error, committed by some physicians when sending their tuberculosis patients to this or any high altitude, is the advice

to rough it, and take all the exercise possible. I have been told by some that their physicians had instructed them to go to the mountains of West Texas, camp out, drink whisky and rough it. I will admit that a few survive the ill effects of such pernicious advice, but the great majority succumb sooner or later to the rapid progress of the disease, superinduced by exposure, over exertion and excessive indulgence in whisky—most likely the latter. *Absolute rest* is essential to the successful treatment of tuberculosis of lungs in high altitudes until the patient becomes acclimated, and ceases to have elevated temperature, then gentle exercise should be encouraged. Out door life should be insisted upon, and the climate of Fort Davis will permit a patient to spend at least 300 days of the year in the open. The sun is very pleasant in coldest weather when one is protected from winds, and is not disagreeably warm in summer.

The altitude of Fort Davis is too high for those suffering from organic heart diseases, but I don't think a better climate is known for the cure of asthma, hay fever, rheumatism contracted in the lower altitudes, and all malarial troubles.

In writing of the climate of Fort Davis, it is not my purpose to disparage the claims of any place in West Texas for preferment as a health resort, as I believe all that region west of the Pecos river from its mouth on the Rio Grande, extending into New Mexico and Southern Arizona, to be the ideal climate for tuberculosis patients, yet there are certain local conditions favoring Fort Davis, viz.: Its pure water, porous soil and sheltered location from the northers and west winds prevalent at certain seasons. These favorable conditions are not found in all this vast arid region, especially pure, palatable water.

Could our law makers and wealthy philanthropists be aroused to the urgent necessity, and be induced to build and maintain consumptive sanatoriums in this healthful region, especially for the indigent sufferers, many human lives would be saved, the lives of many more materially prolonged, and the spread of "the terrible white plague," which is the scourge of our country, would greatly diminish.

THE PUBLIC CONTROL OF TUBERCULOSIS.

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One feels considerable hesitation in discussing a subject which has been threshed over so many times, but the failure of public authorities to realize the importance of the matter and to take the precautions necessary for the prevention of a disease which can be controlled to a very large extent is sufficient excuse for once more agitating this question.

At the present day there are many physicians who still hold to antiquated ideas or prejudices concerning the infectivity of tuberculosis; there are others who think the communicability of this disease and the necessity for public control of it are greatly exaggerated; still others hold the fatalistic view that the prevention of tuberculosis is a matter of personal resistance. Those who hold this opinion contend that prophylactic measures by public health authorities are impracticable and useless.

As long as such diverse views are held by medical men we can not hope for any advance in the prevention of this "great white plague." The importance of the subject is sufficient reason for reconsidering it, even though it has been worn almost threadbare.

IS THERE ANY NECESSITY FOR THE PUBLIC CONTROL OF TUBERCULOSIS?

The fact that progressive and up-to-date boards of health all over the country are taking active steps to limit the spread of this disease indicates that such necessity exists.

Some legislative bodies are passing laws providing for disinfection, which will really accomplish nothing in the way of preventing tuberculosis. It is unfortunate that efforts are misguided in this direction, for they give a false sense of security.

It is stated that at least one State (California) has attempted to

establish quarantine against the admission of tuberculous patients. When we stop to consider that bubonic plague has existed in California for two years and has gained a foothold that endangers the entire country, through negligence and misrepresentation which is nothing less than criminal, such hysterical and spasmodic efforts on the part of those in authority to control tuberculosis would indicate that it is not only desirable, but necessary.

The necessity for the public control of tuberculosis would depend upon (1) the prevalence of the disease, and (2) upon the cause, manner in which it spreads, and the feasibility of stopping its dissemination.

Although figures are often quoted, the prevalence of tuberculosis is seldom appreciated. In 1890, according to the death rate in the registration districts of the United States Census Bureau, there were 153,000 deaths from tuberculosis in a population of 63,000,000. In 1900 there were 145,000 deaths from the same disease among a population of 76,000,000. The mortality statistics for cities show that from one-tenth to one-seventh of all deaths in cities are due to tuberculosis.

With the exception of pneumonia, tuberculosis causes more deaths than all the common acute infections combined. According to the last census report, tuberculosis caused more deaths in 1900 than scarlet fever, diphtheria, typhoid fever, malaria, smallpox, dysentery and cholera infantum all together. If some of these are deemed of sufficient importance to be placed under public control, then, surely, tuberculosis should be dealt with in the same way. Merely because tuberculosis is a disease of long duration is not sufficient excuse for shirking responsibility in regard to it.

It is not pleasant to contemplate that of the three millions of people living in Texas at the time of the last Federal census enumeration, between 300,000 and 400,000 are certain to die of tuberculosis unless radical measures are taken to prevent its spread. This is not the prediction of an alarmist, but is as certain as is the entire system of life insurance. Life insurance is not a lottery, but a certainty, based upon the experience gained from large numbers and expressed in statistics.

In the western portions of Texas there are additional reasons for the public control of tuberculosis. Consumptives from all parts of the country come to these places to secure the advantage to be derived from the climate. The vital statistics of San Antonio for 1902 show that 27 per cent of all deaths were due to tuberculosis, and the same rate doubtless exists in other places where the vital statistics are not kept so accurately. In most cities from 10 to 14 per cent of all deaths are due to this disease.

The experience of San Antonio is merely a repetition of that of Denver, where the death rate from tuberculosis is over 26 per cent of the total mortality. In both cities fully half of these deaths occur among non-residents. In both cases, however, there has been a steady increase in the mortality rate from tuberculosis among the permanent residents. This has been very ably shown by Dr. Frank Paschal in San Antonio and by the late Dr. Wm. P. Munn in Denver.

No one can deny that tuberculosis is due to a specific micro-organism, or that every case of the disease is caused by the bacteria given off by some person or animal suffering from the disease.

The spread of the disease can be prevented by destroying or disinfecting the discharges (chiefly the sputum) before they are allowed to dry; and by disinfecting rooms, carpets, etc., that have become infected through prolonged occupancy by a consumptive. Even though a patient is careful to collect the sputum in cups and not use handkerchiefs, some fine droplets are given off in the act of coughing, which make it necessary to disinfect and thoroughly clean a room that has been occupied for a long time by a phthisical patient.

Exposure for a short time to dust containing tubercle bacilli is not sufficient to cause the disease. Infection only follows repeated exposures or exposure for a long time. Prophylactic measures entail no hardships of isolation and quarantine as in dealing with the acute infections. These precautionary measures are easily carried out by the individual, but the disease should be under the con-

trol of the public health authorities to make certain that they are not neglected.

Statistics show that in Germany one-third of all deaths occurring between the ages of 15 and 60 are due to tuberculosis. The United States Census Report for 1900 shows that over 80 per cent of the deaths from tuberculosis for that year occurred between the ages of 15 and 60.

With these data before us as to the number of deaths from tuberculosis at the very best time of life, it must be clear to every thoughtful person that it is the imperative duty of States and municipalities to make every reasonable effort to check the spread of this disease. No less a statesman than Disraeli said: "It is the first duty of the State to protect the lives and health of its citizens." If tuberculosis ran a short course, like the acute contagious diseases, the people would demand that they be protected against it, as is the case with smallpox, diphtheria or scarlet fever.

The vastness of the task can be no argument against doing what we can. When Jenner announced his discovery of vaccination, smallpox was causing a greater death rate than tuberculosis is now. Doubtless at that time pessimists thought it impossible to alter the mortality rate from that disease by prophylactic measures, just as they contend at the present day that it is impracticable to attack the tuberculosis problem by public health measures. But where vaccination has been carried out systematically, as in Germany, the results speak for themselves.

Since a specific cure has been found for diphtheria, those who oppose preventive medicine might contend that it is not necessary to give as much attention to the prevention of this disease now as was formerly given. Instead of that, preventive measures are more rigidly enforced now than ever before. Not only do cities maintain bacteriological laboratories for the early recognition of doubtful cases and to determine the duration of isolation, but each year we see additional steps taken, at great expense, for the medical inspection of schools, largely to do away with the "school influence" in spreading this disease.

No sane man would today contend that a case of smallpox or a case of diphtheria should not be isolated, because in the one case individuals may be protected by vaccination, or because, in the other, the disease can be cured with certainty by the early use of antitoxin. If preventive measures are desirable in these diseases, how much more necessary are they in the case of tuberculosis, which can not be prevented by increasing the resistance of every individual, and for which we possess no certain and specific remedy!

It is stated by some that the public control of tuberculosis is a matter of such proportions that it can not be carried out. It should be remembered that this disease is easily prevented, and the prophylactic measures, both private and public, can be taken with less expense, inconvenience and hardship than is frequently imagined.

The control of tuberculosis by the public health authorities does not present the difficulties that are met with in the prevention of typhoid fever by the purification of public water supplies. Municipalities do not hesitate at such undertakings, although the saving of life is less than can be accomplished by reasonable measures to control the spread of tuberculosis.

The question may be asked: Is it practicable to influence the mortality rate from tuberculosis by the public control of the disease? Can the public health authorities deal with the tuberculosis problem, or must it be solved by physicians in attending to each individual case?

We can best answer this by comparing the mortality rate from tuberculosis in cities where this disease is recognized and dealt with as a communicable disease, with the rate in other cities where no attention is paid to the matter by the public health authorities.

Dr. Hermann M. Biggs, in a paper published last year on "The Sanitary Measures for the Prevention of Tuberculosis in New York City, and Their Results," showed conclusively that the mortality is being very rapidly reduced in that city. The reduction is out of proportion to the general decrease in the mortality from this disease.

In 1890 the mortality from tuberculosis in New York City was

3.97; in 1900 it was 3.01. This shows a reduction of .96 (i. e., per 1000 of population). For the entire registration area of the census districts the reduction for the same time was .549; for the cities of the United States in which vital statistics are recorded it was .57; for all the cities of New York State it was .536.

In other words, the reduction in the death rate from tuberculosis in New York City was nearly double that in other communities. No other city can boast of such results, and yet the registration of tuberculous patients was only made *compulsory* in 1897, although it had been *requested* of private physicians and required of public institutions since 1893.

It has been contended that this result is more apparent than real; that very many cases are sent where they can get purer air with better chances of recovery, and that they die away from home. Against this argument we would point out that the mortality in New York City remains relatively higher than for any other large American city.

In 1900 tuberculosis caused 11.8 per cent of all deaths in New York; 10.8 per cent in Philadelphia; 9.9 per cent in Boston; 10.5 per cent in Baltimore; 11 per cent in Chicago; and 7.7 per cent in Cleveland.

Surely, the physicians of these other cities are just as careful in the diagnosis and hygienic treatment of this disease as are those of New York, and if this were a factor in the disproportionate reduction in the death rate in that city, it would be apparent when the mortality is compared with that of other cities.

The health authorities of New York City have been pioneers in the crusade against tuberculosis, and have set an example to the world as to what may be done by public health measures in this direction.

WHAT PUBLIC HEALTH MEASURES ARE DESIRABLE AND NECESSARY FOR THE CONTROL OF TUBERCULOSIS.

1. *The registration of all cases with the public health authorities.* The registration of all cases of tuberculosis as soon as the

diagnosis is made should be made compulsory by State law or municipal ordinance. This must be the starting point for all other preventive measures, such as the disinfection of the sputum; the prohibition of promiscuous spitting; the education of patients and their friends as to the methods of preventing the spread of the disease; the disinfection of rooms, carpets, etc.

The opposition which was so vigorously raised ten years ago against the registration of tuberculous patients is largely dying out. The imaginary hardships to consumptive patients do not actually occur where the registration is carried on, and it has now been tried long enough to demonstrate the practicability of this measure. It is worthy of note that these contentions have arisen chiefly where the registration system has not been tried, and we do not hear such strenuous objections to it where the system is in operation.

Experience shows that the predictions of those who opposed the registration of tuberculosis when it was first proposed have not been realized. Tuberculous patients are not branded as lepers; they are not isolated from their family and friends; they are not unable to get employment, or rent a house, or enter a hotel or boarding house, all as the result of the registration of his case. Where such inconvenience is experienced it is because people are ignorant of the way the disease is communicated and the simple means by which it can be prevented from spreading. Neither the consumptive nor his friends experience as much difficulty in these ways in New York as in many other places. When tuberculosis is dealt with by the public health authorities as a communicable and preventable disease, people do not fear the patient who carries a pocket sputum flask and is careful to disinfect or destroy his sputum. On the other hand, people view with alarm the man with a chronic cough who constantly expectorates promiscuously in a community where no effort is made to check the spread of tuberculosis.

Registration is necessary for the purpose of education and also for the disinfection of infected rooms. It does not necessitate publicity and need not work a hardship on any one.

People should be taught that registration does not mean quaran-

tine and isolation of the patient. This has been the great obstacle to the more general adoption of the method of compulsory notification by physicians.

This trouble is largely due to the difficulty in making people understand the particular way in which the disease is communicated from the sick to the well. As long as we speak of tuberculosis as a *contagious* disease this will continue. Notwithstanding the contention of Flick to the contrary, the writer feels very strongly that the method followed by Biggs of calling it a *communicable,* rather than a *contagious,* disease is more expedient, and will, in the end, accomplish more in the way of prevention. This makes a distinction between tuberculosis and other specific infections, and does away with unnecessary fear and antagonism. The latter always results from the popular dread of quarantine and isolation, which is suggested by the use of the word "contagious."

2. *The disinfection of rooms, carpets, etc.* If this is to be effectual, it should be under the control of the public health authorities. No argument is needed for this procedure. The protection to the friends of those who die from tuberculosis and the protection afforded those who live in rented houses are ample arguments for it.

Chemical disinfectants are not absolutely necessary, and are frequently used in such a careless manner that they do no good. Under these circumstances they are worse than worthless, as they give a false sense of protection. Thorough renovation is far preferable to inefficient disinfection by gaseous disinfectants, which are too often improperly applied. The former method is the plan followed by the New York Board of Health.

3. *Every possible effort should be made to educate the people, and especially tuberculous patients and their friends, regarding the dangers of tuberculosis, the way it spreads, and the method of preventing it.*

Much can be done in this direction by enforcing municipal ordinances which prohibit spitting on sidewalks and in public places.

Printed circulars or pamphlets, which have been carefully pre-

pared, should be distributed by the health authorities to the houses of consumptives, giving all this information in plain terms that can be understood by any one. When necessary, among the very ignorant or careless, the sanitary inspector should visit the house and give verbal as well as printed instructions.

Of course, the attending physician should be the chief factor in educating consumptives and their friends as to the dangers of tuberculosis, and the method of preventing its spread; but we are here dealing only with public health measures.

4. *The examination of sputum by the city or State health authorities should be made free of charge.* This not only removes doubts about the diagnosis, and makes the recognition of the disease certain, but it serves to give the health authorities some idea of the existence and location of tuberculous patients. In New York City more than 7000 cases are registered annually from information obtained in this way.

5. Where it is practicable, it is desirable to have *inspection of dairy herds supplying milk to cities.* Koch's view regarding the intercommunicability of bovine and human tuberculosis has now been proven incorrect by Ravenel and others, and we should endeavor to condemn tuberculous cows.

6. *The establishment of hospitals for consumptive patients* is very desirable. These should be provided for incipient cases in suitable localities, looking to the cure of the disease. Others should be provided in more densely populated districts for the care of advanced cases that can not be properly cared for in their homes. This would prevent the infection of many houses.

While these hospitals and sanatoria are very desirable, we should not lose sight of the fact that the majority of cases will still be treated in their homes, and that, even at best, only a comparatively small proportion can be cared for in hospitals.

We should not wait idly for the establishment of such hospitals, but should direct our energies toward securing compulsory registration, inspection, education and disinfection. These measures can be put into operation by every community without great expense.

The establishment of hospitals is an ideal condition, but very few places can ever meet the difficulty in this way. It has been well said that "every city and county must solve its tuberculosis problem for itself." We, as physicians, should lead in this movement and not hide our heads in the fashion of the ostrich in the sands of indifference.

SECTION ON GYNECOLOGY.

SOME OBSERVATIONS ON THE ANATOMY, PHYSIOLOGY AND REPAIR OF THE PELVIC FLOOR.

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To obtain the ideal result in repairing lesions of the pelvic floor, it is necessary to restore the normal anatomy and to bring about a return of the natural functions. This result has been placed within the reach of the modern operator, by the stages of development which have come through the genius of Emmet, Simon, Hegar, Tait, Kelly and others, who have done original work in one direction or in another, elucidating this detail and establishing that principle. It is our privilege to draw fully and freely from these rich developments and in the present paper, for the sake of brevity, and in order to get the central thoughts quickly and clearly before you, any attempt to give credit to this or that authority will be avoided.

Repair of injuries to the pelvic floor at the present time should include careful attention to the following requisites:

First—Restoration of the normal anatomy of the parts which have been injured.

Second—As consequent, a return to normal function.

Third—The protection of the field of operation and of the parts which it is necessary to unite by flaps in the vagina and where the rectum in involved in the injury, by a similar rectal flap, from infection by the vaginal and rectal discharges.

Fourth—The sutures should be arranged—

(a) So as to approximate anatomical structures in their normal relation.

(b) To leave no dead space for the accumulation of clots.

(c) Only absorbable suture material should be used.

(d) The fewest number of sutures should be used compatible with nice approximation.

(e) The sutures should not pass through the skin or mucous membrane, where this can be avoided.

Only brief reference will be made to the anatomy. Passing the fascia, upon which much stress was laid by earlier operators, and which is of importance, yet can be in a measure disregarded, for the reason that it is necessarily restored to its normal relation by the same approximation that replaces the muscles, and the muscles can be accepted as surgical guides to the anatomy of the perineal fascia, the superficial group of muscles, viz.: the external sphincter ani, the superficial transversus perinei and the sphincter vaginæ, joining at a common point between the anus and the vulvar opening, constitute the important external support of the pelvic floor and are lacerated in labor most frequently along natural lines of cleavage, through the fouchette back to or into the rectum, or at one or the other side of the rectum. The deep transverse perineal muscles, the analogues of the constrictor urethræ in the male, are inserted into the same common point on a deeper plane and also have fibers that blend with the vaginal walls and others that pass along the side of the vagina to cross the urethra. The levator ani is inserted in its posterior two-thirds to three-fourths into the sides of the rectum, blending with the sphincters of that viscus, while the anterior fibers pass around the posterior wall of the vagina, blending with each other to form a support to that canal. These muscle structures constitute the important anatomy of the pelvic floor and are the anatomical structures which must be borne in mind, must be sought for and brought together in nice approximation in order to accomplish the restoration to normal function.

The function of the anterior portion of the levator ani and deep transversus perinei is to give tenacity and support to the posterior wall of the vagina, converting that organ into a canal in the nulliparous woman, as can be very easily observed by introducing the

finger into the vagina and making a little pressure upon the posterior wall, in such a way as to excite contraction of these muscle fibers. In addition the anterior fibers of the levator ani perform another important function, by reason of their insertion into the point commonly known as the perineal body, which function is to draw up that portion of the floor of the pelvis in a similar manner and at the same time as the posterior fibers elevate the rectum and the sphincters of this viscus.

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The further important function which is under the control and dependent upon the junction of the group of muscles in the perineal body is the function of defecation. During this act the peristaltic wave from above assisted by the voluntary compression of the abdominal muscles, is further produced by a dragging upward of the rectum and the sphincters, the result of contraction of the fibers of the levator ani, the sphincter muscles being pulled open and peeled back, as it were. When the point of junction of the muscles in the perineal body has been destroyed, the result must be only partial and incomplete action of the levator ani and unsatisfactory emptying of the rectum.

It is considered unnecessary to discuss further the results of these injuries upon the pelvic viscera, such as dragging down of the bladder, interference with micturition, etc., the purpose being to select rather the more important features of disturbance of function with the idea of illustrating the observations which follow upon the methods of repair.

It is impossible to adopt any well defined or fixed rules in regard to the technique of the repair of lacerations of the perineum, other than such general principles as have already been suggested. Each case of injury is a law unto itself and the operation which will accomplish the purpose desired will have to be carefully adapted to the particular case. As illustrating the application of the principles which have been suggested and the technique of the general principles which would be utilized, the three different characters of lacerations will be selected, viz.:

First—A laceration of the perineal body involving all of the structures down to the anal sphincters. This technique will apply similarly to lacerations of lesser degree.

Second—Lacerations including the sphincters of the bowel.

Third—A condition which is known as relaxation of the vagina and vulva and consisting not of injuries to mucous membrane or skin, but of the separation of the deeper structures during repeated labors.

In the first class of lacerations the initial incision should be

made as a rule at the anterior margin, that is, the external margin of the cicatrix, marking the extent of the laceration and at a point about the middle of the laceration, in the middle line of what would be the perineum. The incision should extend from this point along the margin of the cicatrix tissue up each labium to and above the last remaining myrtiform carbuncle; in other words, this incision should follow approximately the line of Tait in his initiatory incision, except that more attention should be paid in the usual cases to following the line of the margin of the cicatrix. In the unusual cases such an incision might invade the outer surface of the labium to too great extent; such cases, for instance, as in which there had been sloughing of the perineum and labium with loss of tissue, rather than simple separation of the parts. The incision should extend upwards on each side to the lowest remaining myrtiform carbuncle, or even just a little higher always, and should not be to the outer side of these structures, but end within these structures. This flap should be dissected from the vaginal floor with the scissors and finger, taking only the mucous membrane, which can be easily peeled up and should be separated from the tissues as high up in the vagina as the relaxation of the posterior vaginal wall seems to extend.

Comparatively little hemorrhage will be encountered and very little use will be had for either knife or scissors. The tissues exposed will be on each side immediately within the labia, the sphincter vaginæ superficially, with at their lower extremities the divided ends of the transversus perinei; more deep and careful dissection should demonstrate the deep transversus perinei and the anterior fibers of the levator ani. Such minute dissection, however, is not necessary in the ordinary operation. The first sutures, where there is much relaxation of the vagina, should be placed high up underneath the vaginal flap in such a way as to catch on each side the anterior fibers of the levator ani and fibers of the deep transversus perinei. The needle can be passed into the tissues on the right side (of the operator) within the sphincter vaginæ not including that muscle, passed inwards, then across to

the opposite side, including the same tissues, back again on the right side and down on the opposite side, making a double suture drawn back and tied in such a way as to draw the tissues together. This suture should not include the sphincter vaginæ and would leave the vaginal flap still separated above from these tissues. After this first suture is tied and in position, another suture should be passed beyond the sphincter vaginæ on the right side, not including it, through the tissues of the right side of the pelvis, superficially then along the under surface of the mucous membrane so as to include the under surface of the vaginal flap, out through the tissues of the left side in a similar position and should be tied in such a way as to destroy dead space that might be created between the vaginal flap and the tissues brought together by the first suture. After these sutures are in place and tied to the satisfaction of the operator, a needle should be passed through the divided ends of the transversus perinei on the right, the needle not necessarily passing deep, only catching sufficient of the muscle to insure a firm hold, and pass the full length of the structures on this side of the vagina which were not included in the first suture, thence across to the other side and back out, including similar structures; the needle should then pass through the sphincter vaginæ of the right side, a little above the end of the transversus perinei and back out through the similar structures of the left side, making a double suture, which should approximate the parts and should be tied. The next suture should pass just within the mucous membrane through the tissues of the right side on a plane a little higher than the last suture through the sphincter vaginæ and should include all of the tissues upon that side of the wound of operation, should cross over to the left side and back out, emerging just beneath the edge of the mucous membrane. If necessary another suture of the same character should be introduced in order to approximate the edges of the incision in each labia. One of these sutures, not the first one, should include the under surface of the mucous membrane so as to draw it in apposition with the tissues beneath and in this way destroy the dead space that might be left.

The high suture should pass under the edge of the mucous membrane in the incision of the labia, underneath the tissues to the edge of the vaginal flap and should follow the margin of the vaginal flap through its whole length to emerge on the left side in a similar position. The effect of this suture will be to draw the edge of the vaginal flap as with a gathering string down close to the junction of the external incision, and if necessary for neater approximation the margin of the vaginal flap should be trimmed, but it should be left sufficiently long to make a covering from the vaginal side against the secretions from the vagina.

In the majority of instances the sutures which have been described will be sufficient to neatly and nicely approximate the margins of the incisions in the external labia, and when the operation is finished to this point there will remain externally only the line of approximation at the point of the new vestibule with the vaginal orifice narrowed until only the urethra is left in view. If the margin of the skin and mucous membranes along the line of approximation do not come together nicely, they should be brought together by a continuous subcutaneous suture of chromacized catgut or silkworm gut, or silver wire, which can be withdrawn after the parts have healed.

In the operation for complete laceration through the sphincter of the anus, it is important to note with great care the points at which the anal sphincter ends, which is usually marked above by cessation of the rugæ around the anal opening and by a slight dimple or pucker. The initial incision should start on each side at a convenient point above this end of the anal sphincter, about the level of the septum between the vagina and the rectum, the point being a matter of selection in each case. From this point the incision should follow the line of the septum separating the vaginal mucosa from the rectal mucosa or dividing the cicatricial tissue which lies between these two structures. From each external end of this incision an incision should be carried downwards and just to the inner side of the pucker produced by the end of the anal sphincter. The rectal portion of the flap should then

be carefully separated from the vaginal wall and the dissection should be carried along the sides of the rectum so as to permit the flap, constituted of the posterior wall of the rectum, to be drawn down and out sufficiently to entirely protect the sutured parts from the rectal contents. As the rectum is comparatively loosely fastened, this can be easily done without difficulty. If the laceration extend quite a distance up the rectum, it may be necessary to reflect a portion of this flap from the vaginal mucosa, as described and executed by Dr. Howard Kelly. After this flap is ready the dissection should be extended so as to expose the ends of the anal sphincters, which should be drawn forward, the muscle stretched and the ends securely sutured in approximation by continuous returning sutures of cat gut. Then the rectal flap should be brought out and fastened about the outer surface of these muscles in the natural position, leaving the rectal surface complete without an opening. The vaginal portion of the operation should be completed as described for incomplete laceration.

In operating for relief of relaxed vaginal outlet, the same principles should be followed. The initial incision should follow natural lines, so as to approximate labia naturally, the vaginal flap should be thrown up freely, the structures which have given way should be sought and brought together by carefully arranged sutures, so as to restore normal conditions.

The result of such procedures carefully and intelligently carried out will leave conditions which are not painful to the patient—as a rule morphine is not necessary—which unite promptly and securely without reaction, and which bear well the strain of subsequent labors.

DISCUSSION.

DR. C. E. CANTRELL: I would like to thank the doctor for the description of his operation for a complete laceration, as I have been doing some work along that line, especially on those on the anterior wall of the rectum. You will find by referring to the proceedings of last year that I wrote a paper describing an operation that seemed the best in my opinion, and the operation that has given me less trouble than all others that I have attempted for complete laceration of the perineum; by advancing of

the rectum, you have no sutures of any kind in the rectum. I do not know where I got the idea; the few ideas that I get, I forget frequently where I get them. I am able to restore the sphincter ani satisfactorily, where it had been completely torn through. The first one I had operated on twice before I tried this method, and was not able to get union of the sphincter ani, but when you bring the rectal mucosa down and put your sutures over a solid mucous membrane, you haven't the same trouble to get it to grow that you have in a perineal laceration, where sutures are put in the bowel. I tried to describe this last year. I am very much pleased to see that some one else is having success with that operation.

DR. GEO. H. LEE, replying, said: Reviewing very briefly the discussion of my paper, I will say, with reference to stretching the sphincter ani before operation for the repair of incomplete laceration, that I have not found it necessary or advisable to stretch that muscle; such stretching adds to the suffering after the operation.

The vaginal flap can be lifted up, beginning along the anterior border of the scar up the laceration and can be peeled back, denuding the structures along the floor and sides of the vagina, and then the sutures should be passed so as not to include either the skin or mucous membrane. The parts should come together easily and naturally without tension, and the skin fit so nicely as not to necessitate a skin suture. The result should be the minimum of post operative pain. Morphine is usually not needed.

I am sorry my paper was not understood; the fault is mine, in that I probably read too rapidly. The suggestions I wished to make and emphasize are:

1. That the initial incision should be along the line indicated by the anterior border of the scar of the laceration.

2. The denudation should lift up the vaginal flap, preserving it from puncture, so as to furnish a protection from infection from the vaginal discharges. The rectal flap should be similarly arranged in operations for complete laceration, to protect from fecal contamination.

3. The denudation should fully and freely expose the divided muscular structures, so that these can be brought together in their normal relations without tissue between.

4. The muscle structures should be brought together by absorbable suture, placed with a view to approximating the different divided ends of muscles, and arranged subcutaneously, avoiding skin and mucous membrane.

It is not my purpose to ignore the fascias of the pelvic floor, and for this reason I called attention to the fact that in uniting the muscular struc-

tures in the manner suggested, the fascias are necessarily restored to their normal relation.

Emmet's operation was not based on proper consideration of the anatomy to be restored. He aimed to fill up the space between the rectum and vagina, and narrow the opening of the vagina by putting tissue into the opening and building up a perineal body. The effect of his operation is most often not to closely coapt the ends of divided muscles, but to place and fasten tissue between those ends.

AMENORRHEA—SANTONIN IN.

C. C. COMER, M. D.,

CARTHAGE, TEXAS.

It is not necessary for us to go into the minute definition, causes, diagnosis and treatment of amenorrhea, in which every doctor here is well versed both from the text book and practical experience.

It is not the intention of this paper to be a scientific research nor an intellectual treatise, but a simple, practical experience of a few cited cases that will possibly be of some benefit to us.

Amenorrhea is defined as an absence of the menses in adult women who are not pregnant, and have not passed the menopause, or suffered from retention of the flow. It results from various causes which affect the general system, or the genital organs in particular.

Causes: That which affects the nervous system, as anger, anxiety, fright or grief.

The general nutrition; as protracted fevers, chlorosis, pulmonary tuberculosis, Bright's disease, malaria, and general anæmia, etc.

Pelvic disorders; as absence of the uterus, or ovaries, or diseases of same.

Change in mode of living; school girls and nurses of a training school, from over mental work and not enough physical exercise.

Traumatic injuries; renal insufficiency, obesity, luxurious living.

The most common we have is from taking cold during the period, and anæmia. The following cases are interesting to me for they demonstrate the beneficial effects of santonin, as a remedy for amenorrhea, especially as a nervous sedative and emmenagogue.

Miss D., age 17 years, gave a history of chronic chills and fever of three years duration, commenced menstruating at 12 years, as a normal flow. In the second year of chills and fever menstruation stopped. Was called to seè her with a congestive chill. Twelve

hours after the chill convulsions appeared, which lasted for eighteen hours, possibly one every three or four hours. I found the spleen filled nearly the left side of the abdominal cavity extending two inches beyond the medium line to the right and tender, liver enlarged. Urine specific gravity 1008, and scanty, albumen. Feet and legs swollen, coated brown tongue. General appearance pale, and anæmia.

Treatment: For congestive chills, morphine, atropia and quinine, hypodermically. For the convulsions, chloral, morphia and bromide, and ordered 10 grains santonin at bedtime. The first dose santonin controlled the spasms, second dose the menses slightly appeared, and third dose a reasonable good flow, followed with Basham's iron mixture, calomel, podophyllin and ipecac, continued for three or four months; results, menses gradually became normal, spleen and liver greatly reduced and health restored.

Miss W. gave a history of typho-malarial fever, lasting sixty-five days, with slow convalescence, producing a total cessation of the menses for twelve months; during this time she suffered from general anæmia, and occasionally with accompanying symptoms of general debility. She was 16 years old, and had normal flow and regular periods every month previous to the fever. Symptoms: Bowels constipated, urine specific gravity 1010, albumen, constant headache, periodical pains in bowels, swelling of feet and legs, no appetite, white coated, puffy tongue, general malaise. Did not examine blood.

Treatment: Basham's iron tonic as a blood builder, and calomel, podophyllin and ipecac as an eliminator. Santonin as an emmenagogue. Kept her on this for three months and the flow came on the second month slightly and the third month normal; continued the treatment five months, which resulted in a cure.

Mrs. M. brought her daughter, Miss Effie, to my office for examination and treatment. Miss E., age 18, was a robust and well developed woman, weight about 140 pounds. From all appearance in excellent health. She gave the following history: At 12 years

old she menstruated, and was irregular for about one year afterwards, became permanent and regular and of normal quantity up to her 16th year. During one of her periods she was fishing and accidentally fell into the water; this stopped her flow for eighteen months; during this time her health was perfectly good, but convulsions developed at the would-be regular period, and continued for four days, sometimes as many as twenty per day. After the fourth day the convulsions would cease, consciousness would return, and was well for four weeks. This had been repeated for about six periods when I saw her. I advised an examination, which was consented to, and made. I found all the generative organs in normal condition—the vagina, ovaries and uterus. The nutritive organs were acting well, and system well fed. I concluded the functions of the nervous system were seriously disordered, and causing all the trouble, and directed my treatment partly to this. In three days her period was due, so advised them to inform me at its appearance; was called and found her in convulsions; ordered chloral, bromide and morphine at once, which gave some relief after taking four doses; then I concluded to give her santonin, 10 grain doses, and ordered 10 more in twenty-four hours if necessary. I then left her, and told the mother to call me again at once, if she was getting worse, and that I would call again the next day. When I returned she was sitting at the sewing machine doing some work (as she was a girl of her own will). You can not imagine my surprise. I asked why was this? Her mother said: "In two hours after I gave the powder she became perfectly quiet and went to sleep, woke this morning well, and with a good menstrual flow," and that was the happiest family I ever saw. I advised her to give the powders in the future at each menstrual period for three or four months, which she did, and her troubles were ended.

THE MANAGEMENT OF UTERINE DISPLACEMENTS.

L. P. McCUISTION, M. D.,
PARIS, TEXAS.

It is estimated that about one woman in every eight has some form of uterine displacement. This frequency and the consequent discomfort which it engenders is sufficient to invest the subject with importance, hackneyed though it be.

In presenting this paper I have no new idea to promulgate or untried method to advocate. The measures already in vogue for the correction of this deformity, while not altogether satisfactory, are sufficient to yield comfortable results in most cases, if judiciously applied. Gynecologists have long held opposing views as to what constitutes the best methods of treatment in the different dislocations to which the uterus is subject, and hence, many measures have been proposed and practiced from time to time, yet we are today without a satisfactory method which meets the requirements in all cases.

The measures which have been advocated for the correction of this deformity are too numerous to mention in detail, but in epitome are comprised under two heads, namely, surgical and mechanical.

A review of the literature of this subpect during the past few years shows the tendency of authoritative opinion to be in favor of surgical measures. My belief in the unwisdom of this teaching has suggested this paper. In making this statement I would not be understood as saying that the surgical operations for the relief of uterine displacements are entirely useless. On the contrary, I believe that they are often justifiable, many times necessary.

My contention is that most cases are correctable by mechanical means, and that the results thus obtained are more satisfactory and the method less objectionable than by any surgical procedure which has yet been proposed.

It is difficult for me to understand the prejudice which exists in the minds of medical men against the use of pessaries. This opposition must arise from an experience with the misapplication, and not the judicious use, of the instrument. It is true that a great number of pessaries are not only useless, but hurtful, and any pessary is capable of doing harm if improperly used. Yet the fact remains—uncontrovertible—that they are potent for much good.

In order to secure the best results in the treatment of malpositions of the uterus, it is necessary to have a clear understanding of what constitutes the normal position, and the amount of deviation which can take place in the range of health. Not all cases of uterine displacements are clinical abnormalities. It is only when the displaced organ excites local or constitutional disturbance that measures for its restoration become necessary.

It should be remembered that the uterus is not a fixed organ, but is suspended in the pelvic cavity, and under normal conditions has a comparatively wide range of motion. The further fact that it is not anchored by any one set of ligaments should be taken into account. The forces which retain it in position are derived from the broad ligaments, the utero-sacral, the utero-vesical and to a lesser extent, the round ligaments.

The perineum is not a controlling force in this suspensory process. It is only through the combined and harmonious influence of these several forces that the uterus is maintained in its normal position. When this harmony of action is disturbed from any cause, a displacement is the result, whether the causative influence be exerted on the uterus itself or upon its supports.

I will not undertake to describe the manifold disturbances which these malpositions cause, but desire to emphasize the importance of determining in all cases whether or not the manifestations present in a given case are due to misplacement, or whether some other causative influence is operative through which they may be explained. A displacement may be the cause of much constitutional disturbance, or the constitutional conditions may produce the dislocation.

Success in treatment depends largely upon accurate knowledge of the relation between the displacement and the existing constitutional disturbance. Then again, some forms of dislocation can only be regarded as anatomical, and in no sense pathological processes.

Lateral displacements, as a rule, are unimportant. Anteversions and anteflexions do not produce much disturbance and are not correctable. Then the only displacements which necessitate measures for relief, are backward and downward dislocations. These may exist in conjunction or separately. In dealing with either of these deformities, the first and most important thing to do is to restore the uterus to its normal position. If it is fixed in its abnormal situation, all efforts to replace it will be futile until the adhesions are broken up or absorbed. When this is accomplished and the uterus replaced, a pessary will, in the majority of cases, be all that is necessary to accomplish a cure. Nothing could be more unsatisfactory than an attempt to use a pessary in a case where the uterus was fixed by adhesions.

There is one point which I deem worthy of notice here, and it is, that in many cases where the uterus seems to be fixed, a closer investigation will reveal the fact that there are no adhesions, but instead, the fundus is clamped between the folds of the utero-sacral ligaments, and is not adhered at all. A little perseverance in these cases will loosen this attachment, and the womb readily goes back to its proper position.

The kind, form and size of pessary are matters of the greatest importance. While many different shapes and kinds of pessaries have been used and advocated, there are only two, which, in my judgment, possess merit, and they are capable, if properly used, of meeting all the requirements. These are the Hodge-Smith and the Ring Pessary of Peaslee—no others are worthy of consideration, except, possibly, the Graily Hewitt Cradle pessary, adapted for use in cystocele.

There are numerous reasons why physicians fail in the use of pessaries. Chief among these is a mistaken idea as to the prin-

ciples upon which they operate. A clear understanding of this principle is essential to that perfect adaptation which alone can succeed.

It is to be remembered that a pessary does not exert its influence by making pressure against the womb, nor by distension of the vagina alone, as has been asserted, but by its leverage action upon the ligaments which makes more tense the natural anchors. This pressure is exerted upon the posterior wall of the vagina in such a way as to force the cervix backward toward the hollow of the sacrum, and this in turn restores the fundus to its proper position.

Extreme care should be exercised to see that the fundus goes forward and that there is no flexion in the body of the uterus, otherwise the pessary may rest in the concavity of this flexion and not only fail in its purpose, but become an actual source of irritation. In order to succeed with a pessary it is necessary to have a clear and concise understanding of the condition of the patient, and to know what is expected of the instrument, and then to be sure that it is accurately and skillfully fitted to the case in hand.

There is no other remedial agent with which I am familiar that yields more prompt and gratifying results than a pessary properly adjusted, and there is certainly no measure more disappointing if not skillfully fitted. It is, in my judgment, this inattention to the details of the treatment which has brought this instrument under the ban of gynecological iconoclasts and created an unjust prejudice in the minds of medical men against their use and caused them to seek other means of correcting this deformity.

In this age of surgical triumph it is but natural that the resource of this art should be sounded in the hope that it might offer some better and more satisfactory method. The result is, that many operations have from time to time been proposed and practiced with varying degrees of success and failure.

It is not my purpose to enter into a detailed discussion of the merits or vices of these several operations. In a general way, I will say that they have been disappointing in their results and in most cases possess no advantage over the mechanical treatment.

Of the different operations, probably that of shortening the round ligaments externally, the original Alexander operation, has better stood the test of time and experience than of any of the others, and there is no doubt but that in a suitable case the operation will yield good results. However, the force exerted by the round ligaments in the suspensory process of the uterus is not great, and in most cases where there is much resistance caused by inflammatory thickening in the posterior ligaments, or where the uterus is unduly heavy from hypertrophy or hyperplasia, the operation is likely to fail. Then it will be seen that this operation is only indicated in detrodeviations of the virgin uterus uncomplicated with adhesions, and it is in this class of cases that pessaries yield such brilliant results. What has been said of Alexander's operation applies with equal force to the several operations for shortening the round ligaments internally.

Ventral fixation is not, in my judgment, justifiable. The operation is illogical and unsurgical. It is uncertain in its results, and even if the womb should remain anchored in its new situation, it is but the substitution of one abnormality for another whose disadvantages are too apparent to call for detailed recital here.

I have had no experience with vaginal fixation methods and can only express an opinion based upon the theory that any operation which fixes the uterus, and does not permit a fair range of motion, can only be detrimental.

That measure will succeed best which not only restores the truant organ to its proper position, but maintains it with the least interference with the performance of its physiological functions. Mechanical supports effect a result which more nearly approaches the normal condition of the womb than any other method, since they do not limit its movements, do not interfere with the pelvic circulation, and in no way abridge the natural functions.

I have recently read an article by a distinguished surgeon, in which he gives five reasons why pessaries should not be used in uterine malpositions, and as these embody in substance the sum of contraindications which have been urged against this method of

treatment, I take the liberty of reproducing them here. They are as follows: First, the possibility of retaining the uterus by the aid of tampons; second, existence of inflammations, as salpingitis, metritis, vaginitis, etc.; third, ruptured perineum; fourth, bending of the uterus when the pessary is in place; fifth, pain produced by the pessary.

These objections, when critically analyzed, are easily demolished, since there is no single one of them which is tenable. With reference to the first, the possibility of retaining the uterus by means of tampons, I will say that a pessary creates no more pain or irritation than a tampon, corrects the deformity better, and has not the disadvantages of having to be frequently removed and replaced, thus permitting the uterus, unsupported, to resume its old abnormal situation. Existence of inflammation is no more of a contra-indication to the use of the pessary than to any other method.

The third reason, ruptured perineum, is not an argument against their use, for the reason that the rupture should be repaired as the first step in any method of treatment. The fourth reason, bending of the uterus when the pessary is in place, is merely a condition which calls for extreme care upon the part of the physician, and its importance has been emphasized in a former paragraph. And the fifth objection, pain produced by a pessary, does not hold, for the reason that a pessary properly fitted does not produce pain.

If I should attempt to define the indications for operation and mechanical supports in the abstract, I would say that surgical measures are designed to restore the uterus to its proper place, and mechanical methods to maintain it. Then operations would be reserved for those cases of displacements complicated by adhesions wherein the uterus can not be replaced by ordinary methods, and where the displacement provokes sufficient discomfort or disability to render its victim unfit for the ordinary duties of life.

After the adhesions are broken up and the uterus restored to its proper position, a suitable pessary should be used to retain it. This will, in my judgment, yield better results than any of the operative methods yet designed to fix or suspend it. If the opera-

tion would in truth suspend, and not fix, the uterus, the use of a pessary as a supplementary measure would not be needed, but this happy result can be expected only in a very limited number of cases.

I have no doubt that ligamentous bands sometimes form after the suspension operation of Kelly, but this takes place too infrequently to be relied upon as a justification for the operation.

It is presuming too much upon the reparative power of nature to expect her to construct adequate anchors in even the majority of cases. I am aware that in making this statement, I express an opinion distinctly at variance with men of recognized authority, with some of whom it would be considered almost a sacrilege to differ, yet this opinion is the derivative of my experience amplified by observation and supported by the views of many conservative practitioners.

After all, therapeutics, in its most comprehensive significance, is but the application of the plain elements of common sense to the treatment of disease, and he will succeed best who has the keenest scent for the intricate trail between cause and effect, and the wisest judgment in adapting his methods to meet the exigencies of individual conditions.

THE TREACHEROUSNESS OF CATGUT IN ABDOMINAL SURGERY, WITH REPORT OF CASE.

M. SMITH, M. D.,

SULPHUR SPRINGS, TEXAS.

I appreciate the inelegancy of the title of my paper, but it so lucidly expresses the conditions that I wish to speak of that I prefer to use it. I know of no other word or term that can express or convey to the thinking, investigating mind such an impression as the word treacherous. It carries with it the very essence of disappointment, and having had just such an experience with catgut as a suture material in some abdominal cases, I was tempted to give my paper this title, "The Treacherousness of Catgut in Abdominal Surgery."

I am fully aware of the fact that the question of suture material is one of varied experiences—one operator using silk, and claiming its advantages over all others; another operator using catgut, advocating it to the exclusion of all other material except in exposed surfaces.

I am sure that all will agree that catgut is the most used material of any and has grown in favor because of the modern methods of sterilization having been almost perfected, or at least to such an extent as to be considered safe to use as buried sutures anywhere in the body. With all this before us, we know, from perhaps a sad experience, that it is not all rendered aseptic, and just at the time when we most need pure, good suture material we get the unpleasant results, hence I still cling to the title treacherousness.

I will not burden you with the detailed description of the many ways of preparing catgut for surgical use, but will say that all of it that claims to be sterile has been subjected to a temperature of from 130° F. to 212° F. from thirty minutes to three hours, each thread is then examined microscopically, afterward being immersed in various solutions, hermetically sealed and sent out for use.

I noticed in one of the April numbers of the *Journal of the American Medical Association* an article written by Dr. Senn, of Chicago, on the sterilization of catgut, as follows: "Immerse the twisted threads in a 1 per cent solution of iodine for ten days, the container being a small mouth jar or bottle." He claims to have been using catgut sterilized by this method for the last six years in his clinic at the Rush Medical College with uniformly good results. Others have tried it with disastrous consequences. "The advantages of absorbable suture material is of the greatest importance. We can gauge the time we wish for a suture to be absorbed by using catgut. The plain is absorbed in about seven days, the chromacized in from two to three weeks—Oschner." Silk is never absorbed, and when used to tie off the pedicles of ovarian tumors becomes encysted and frequently becomes the source of all kinds of reflexes caused by the constant irritation of the nerve tissue embodied within its grasp, from which patients complain more than before operation—a condition exceedingly troublesome to the patient and extremely so to the surgeon.

The case in point was operated upon March 4, 1903, for a bilateral intra-ligamentous tubo-ovarian cyst. I was nearly two hours in completing the operation, so fearfully dense were the adhesions. I used No. 1 formaldehyde catgut in closing rent in broad ligaments, and in closing parietal peritoneum No. 2 pyoktanin was used by tying blood vessels and closing muscle fascia in abdominal wound, using silkworm gut for closing the skin. The patient did nicely, bowels moving every day, no temperature, no nausea from chloroform, skin healed perfectly and stitches removed on eighth day, appetite good, sleeping well, free from pain, could move to any position in bed alone by the eighth day. On afternoon of the eleventh day she developed a temperature of 102, and upon examining closely I found a little mass on the right side of abdominal incision. Vaginal examination revealed quite an extensive mass in right iliac region, extending down on the right lateral side of the uterus, till bulging in vagina was plain. On the twentieth day I noticed a little separation of the skin in the lower and upper angle

of the wound, from which a small quantity of pus was escaping. By the twenty-third day the skin had given way and underneath was an extensive cellular inflammation, caused from the catgut used to stitch the muscle fascia. This infected the catgut in parietal peritoneum, and also that which was used in the broad ligament. After this for some days I could remove small pieces of catgut, and as soon as I could get all away wound healed and patient recovered nicely, being in bed five or six weeks, with a temperature of from 100 to 103 from the eleventh day until about the first of April.

Why do I say it was the suture that caused the infection? First, because of the time it came on; second, because as soon as it was removed source of infection was stopped, fever subsided and wound healed rapidly; third, because I know my instruments, assistants and everything pertaining to operation was absolutely clean and sterile, patient being prepared by one of the best and most conscientious nurses I ever saw; fourth, because, having eliminated all other sources, I could not account for it in any other way.

The catgut I used was prepared by B. K. Hollister & Co., of Chicago. I have been using it prepared by the above firm for five years, and only this one instance could I trace any trouble directly to it. With this treacherous nature considered, I can not help liking catgut. It is, after all, the most used and appreciated suture material.

SECTION ON OPHTHALMOLOGY, OTOLOGY, RHINOLOGY, AND LARYNCOLOGY.

CHAIRMAN'S ADDRESS.

HENRY C. HADEN, M. D.,

GALVESTON, TEXAS.

The subject which I have chosen for my address to you is: "The Study of the Muscle Balance for the Detection of Latent Insufficiencies During the Routine Examination of the Eyes of Those Who Come to Consult Us."

For many years it has been a recognized fact that careful correction of errors of refraction and accurate adjustment of the lenses would not only improve vision, but would cause headaches to cease and relieve many reflex phenomena of a disagreeable nature. The wearing of glasses, however, in many instances failed to relieve the suffering and then came the awakening to the fact that for one to enjoy binocular single vision something more than the exact focusing of light upon the fovea of each eye was necessary, and it was that the power of the extrinsic muscles which move the globe should be so nicely balanced that at all times and under all circumstances the rays of light should fall on parts of the retina of each eye whose positions bore a constant definite relation to each other. In the past decade and a half much work has been done in the investigation of muscle imbalance and a great deal has been written about it. Indeed, there has been so much confusion in the nomenclature and so many instruments devised for testing the muscle balance and treating disturbed conditions of its equilibrium that the subject has become appalling in its intricacies. My object in addressing you is to advocate thoroughness and at the same time

simplicity in the routine examination of eye muscles. It is my belief that the state of the muscle balance should be known in every patient who comes to the office. Of course I exclude traumatic and acute inflammatory conditions. That which I wish to emphasize is that the mere knowledge of the muscle balance for distance is of no value. Habit parallelism of the visual lines may exist in persons in whom there is little or no convergence power and whose eyes are therefore of no use for close application. It is no uncommon thing to find orthophoria for distance, with 6° to 10° of exophoria in accommodation with a marked disproportion between adduction and abduction and little or no convergence. Esophoria of from 1/2° to 6°, or 7° for distance, may be found while there is an exophoria of 5° or 6°, or even higher in accommodation. Very high degrees of esophoria (12° or 13°) may exist with orthophoria in accommodation. It is in these latter cases that damage is often done by attempts made to correct the esophoria through tenotomy of the interni. The esophoria is corrected for the time, but at the price of convergence and an ultimate outward deviation of the visual lines. Again, there may be apparently normal balance both for near and distance, that is, orthophoria for distance and in accommodation according to the usual tests. With the correcting glass, the patient having normal vision, it would be expected there would be no asthenopia, but after some days, or weeks, the patient returns, complaining that he is unable to use his eyes for close work at any length of time without producing fatigue, headache and other unpleasant symptoms. The cause for this is that there is a disproportion between adduction and abduction and little power of convergence. In these cases a few days exercise with prisms placed bases out will raise the adduction and power of convergence and give relief without necessarily altering the state of orthophoria. The explanation for this state of affairs, I believe, is that many persons have habit parallelism without ever having awakened sufficient innervation to control convergence, and it is demonstrated that the power lies dormant by the rapidity with which strong convergence is acquired under instruction.

One of the chief reasons for neglecting to take the few steps which it is necessary to acquire a knowledge of the state of the muscle balance is the time that is occupied in the routine examination of the patient, but it is sufficient recompense for the ten minutes spent, if we can discover the one case out of possible many in whom the wearing of glasses will not re-establish the disturbed muscle equilibrium. Unquestionably in many instances all that is necessary is to wear correcting lenses. For in a proportion of these cases the muscle imbalance is dependent upon the disturbed relation between accommodation and convergence, the result of errors of refraction. The question presents itself: What is the best method to pursue in making these examinations? There are on the market numerous phormeters, clinoscopes, clinometers, prism batteries and rotary prisms, all of which have their advocates. My own experience has convinced me that expensive and complicated apparatus is unnecessary. In giving you a brief detail of the manner in which I proceed in these examinations, which is nothing new, I may be pardoned for the personality and for the simplicity of my method when I assure you that it has proved satisfactory in many hundreds of cases and has been consistenly carried out in every instance in my private practice and most of my hospital work.

After the patient's history is taken and the usual superficial looking over is done the vision is measured for five meters distance and the near point of accommodation for each eye. I proceed then to test the lateral and vertical balance for distance; for this purpose I use the ordinary Maddox rod test, having the patient look at a small point of light in the center of a dark screen five meters away. For the near test vertical diplopia is produced by placing a prism base down before one eye and having the patient look at a small black dot drawn on a white card, which is held at 30 c. m. from the eyes. The prisms which are found in any trial case may be used to measure the amount of deflection of the streak of light, or of the dot. These will accomplish the purpose as well as any of the rotary prisms, or phorometers, provided one uses

care to see that the base apex line of the prism is held horizontally or vertically, depending, of course, upon whether one is testing the horizontal or vertical balance. Prism abduction is next measured by finding the strongest prism placed *base in* with which the patient can see a single light whilst looking at the test light before mentioned. Prism adduction is measured in the same manner but the base of the prism is placed out. The near point of convergence is then obtained in the usual manner by having the patient look at a fine point which is approached to the eyes in the median line. The order in which these tests are made is of importance. The test for abduction and adduction and convergence should remain for the last, for the voluntary effect which is evoked in these latter awakens a latent innervation which would vitiate the other tests were they made primarily. I do not make a special test for cyclophoria, for my experience has not taught me to believe that these disturbances of the vertical axes exist as frequently as one would suppose, nor are they of the clinical importance that the writings of certain men would lead us to believe. The routine which I have described is all sufficient to detect most errors and if persistently adhered to will, I believe, prevent the passing through our hands, unsuspected, any cases of latent muscular insufficiency. If, however, after our examination one is at all in doubt we have still recourse to the parallax, the cover and diplopia and colored glass tests. There are, also, useful adjuncts in studying a case after the muscular defects have been detected; as is also a careful measurement of the field of binocular fixation. Should the person under examination be wearing correcting glasses they should be worn while the tests are made. The objection which is commonly made to the Maddox rod is that results obtained with it are not always exact. That occasionally 1/2° to 1° of esophoria may be shown when other tests show orthophoria. Even if this be true, which I have not found it to be, of what importance is it? As I have stated, esophoria, exophoria, or low degrees of hyperphoria are of themselves of no matter. That which is necessary is that convergence should be in harmony with accommodation, and

that there should be a relatively constant flow of nervous stimulation to the extrinsic ocular muscles sufficient to keep the visual lines parallel without conscious effort. This state may exist and at the same time the different muscle tests, which have as their modus operandi the exclusion of the desire for binocular single vision, may show heterophoria. Unquestionably in many instances the heterophoria may not be of a purely functional nature, but may be due to faulty insertion of the muscles, abnormalities in their shape and size; or to peculiarities in the development of the orbit. As these defects are of a long standing, nature ofttimes learns to compensate for many of them provided they are accompanied by good vision. Our understanding of binocular single vision is very imperfect, and our progress towards a thorough knowledge of it slow. One thing, however, that we have learned, through careful study of our cases, is conservatism in operative treatment, and the next ten years will show fewer secondary squints than the past.

TRAUMATIC AFFECTIONS OF THE CRYSTALLINE LENS.

JOHN O. McREYNOLDS, M. D.,

DALLAS, TEXAS.

1. Dislocations.
2. Direct injuries of capsule.
3. Indirect injuries to lens.

There is no surgical condition in the entire domain of ophthalmology that requires more careful discrimination than traumatic affections of the crystalline lens. The surgical procedures indicated for the well established diseased states of the eye, such as senile cataract, pterygium, strabismus, entropium and glaucoma are generally very plain and are in accordance with fixed rules and the question of individual judgment does not play so important a part. But with regard to the injuries of the lens, there are so many possibilities to be considered that one must weigh well his words before giving a dogmatic opinion as to the issues of a given case. I have seen the snapping of a mandolin string in the hands of a young girl, even without perforation of the cornea, lead within a few hours to extreme swelling of the lens with complete opacity followed by all the features of a fulminating glaucoma, and demanding a speedy operation for her relief. And on the other hand I have seen a man who, while engaged in a fight, had his eyeball cut wide open by a rusty pocket knife that entered at the cornea and severed all the tissues intervening between the point of entrance in the cornea and the distal opening near the optic foramen, and with extensive loss of vitreous in addition to the laceration of cornea, iris, ciliary body, choroid, retina, scelera and the periphery of the lens; and yet under appropriate treatment he would recover excellent vision without pain or inflammatory reac-

tion. And thus the cases might be indefinitely multiplied to illustrate that the final result is not proportionate to the extent of the original injury. And yet we would be safe in asserting that all traumatic affections of the lens are serious in their very nature, as will be easily understood from a consideration of the parts involved.

The lens in its normal state is composed of transparent layers of elastic proteid matter arranged in concentric order and securely inclosed in a thin capsule of fibrous tissue, which is held in place in the fossa by the suspensory ligament which passes from the equator of the lens to the ciliary processes. As no blood vessels enter the normal lens its nutrition is obtained through the neighboring lymphatics. And whenever these avenues of nourishment become interrupted in any marked degree the lens undergoes degeneration with resulting opacity. And thus an injury apparently insignificant may sometimes lead to traumatic cataract by the influence produced in the channels of lymph from surrounding structures.

In this way lenticular opacity may follow a dislocation of the lens even where there has been no visible rupture of the capsule, and also injuries to the ciliary region not directly implicating the lens may lead to lenticular changes on account of the impaired function of proximal tissues. But by far the most frequent and most important traumatism of the lens is that dependent upon a rupture of the capsule, which may occur either by direct entrance of a penetrating instrument or by the indirect influence of concussion.

The character of the lens substance is such that it will swell up and become opaque when brought in contact with the aqueous and vitreous humors of the eye. And thus a rupture of the capsule that is not speedily closed will invariably lead to an opaque condition of those lens fibers that have been subjected to the action of the aqueous or vitreous, but especially the former. The extent and rapidity of the lens involvement will depend upon the character of the lens substance and upon the facility with which it

becomes permeated with the fluids of the globe. And thus we find that an extensive laceration of the capsule, other things being equal, will be attended by a more rapid development of traumatic cataract. When the aqueous gains access to the lens fibers they swell up, become opaque, degenerate and become absorbed, if the lens is sufficiently soft, as in childhood, and provided the swollen fibers are not presented in such large quantities that the small amount of the aqueous can not dispose of them. In the earlier years of life a traumatic cataract can be made to undergo almost complete absorption. But in the middle and later years of life there is very apt to remain an opaque remnant of the lens associated with the capsule and totally preventing the entrance of light even if the swelling of the lens should not result in serious inflammatory reaction.

The chief danger in the case of traumatic cataracts is that the lens fibers undergo rapid swelling, with pressure on the iris and ciliary body, leading to a severe irido-cyclitis with all its attendant possibilities, even to the point of producing sympathetic ophthalmia in the fellow eye.

The diagnosis of an opaque, dislocated lens does not involve any difficulty, provided intraocular cloudiness from hemorrhage or exudates does not obscure the field.

But an imperfect examination may sometimes fail to reveal the luxation of a transparent lens. Of course the anterior luxations are so very apparent that a direct inspection will establish the condition. But the posterior luxations are best determined by the ophthalmoscope, which will show certain characteristic modifications in the refraction according as the lens does or does not lie between the observer and the fundus. Again, if the periphery of the lens should lie in the pupillary area it will be seen as a crescentic shadow upon the red background of the fundus. And in every case where the backward dislocation is very pronounced the iris having lost its normal support will present a tremulous motion and receding from the cornea will deepen the anterior chamber. The shrunken remains of a dislocated lens may sometimes move

with great freedom within the globe, and I have seen them play hide and seek through the pupil, now plainly visible in the anterior chamber and now securely concealed behind the iris in the posterior chamber.

The management of dislocated lenses will vary greatly according to the circumstances of the case. If the luxation is partial and the lens continues clear, gentle massage may be applied to the globe with a view of inducing the lens to slip back into the fossa, and no operation would be indicated. If the lens is located entirely in the anterior chamber it will generally be best to extract it at once from this situation. If the lens is displaced into the vitreous an expectant plan should be adopted, and if the lens remains clear and does not cause inflammation of the globe it might be allowed to remain. But if the inflammatory features develop it will be best to extract the lens if it is sufficiently opaque to render the operation easy of accomplishment. It is sometimes exceedingly difficult, in fact, as Agnew has said, the most difficult operation in ophthalmic surgery to successfully extract a lens from the deeper regions of the vitreous. In some cases the lens is driven through a ruptured sclera and may be found beneath the ocular conjunctiva from which it may be readily removed.

In severe injuries and even in extensive ulceration of the cornea the lens may be extruded through the corneal wound.

ADENOID VEGETATION IN THE NASO-PHARYNX OF CHILDREN.

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SAN ANTONIO, TEXAS.

In taking up this subject I am well aware that it is one that has been threshed threadbare by many writers whose experience has been both varied and exhaustive. The text-books as well, have gone into this subject with a detail to thoroughness that would seem to leave but little to be said. Consequently there will enter into this short paper much that is a repetition of what has already been brought many times to your attention heretofore. Yet, if we stop to consider, these same repetitions are what impress upon the mind indelibly, subject matter, that when cases come before us we are glad of the patience shown at a time when it was more or less tiresome to listen or to read.

Roughly speaking, the naso-pharynx is bounded below by the velum palati. Its roof is formed by the basilar portion of the sphenoid and occipital bones. The posterior wall, by the atlas and axis, anteriorly presents the chonæ. In the lateral walls are found the pharyngeal openings of the eustachian tubes. At the level of the posterior extremity of the lower or middle turbinate bones from the lower, a ridge formed by the lavator palati muscle runs downward and upward to the soft palate, and from there runs a groove upward and outward towards the vault and posterior wall of the pharynx, called the fossa of Rosenmüller. The pharynx is composed of three coats, first a muscular as a base, then a fibrous and then a mucous. The mucous coat of the naso-pharynx above the level of the floor of the nares is covered with ciliated columnæ epithelium. Below the level by squamous epithelium, and contains simple and compound follicular and racemose glands. Trautmann & Gray.)

Throughout the pharynx are numerous crypts or recesses, the

walls of which are surrounded by lymphoid tissue similar to that which is found in the tonsils. Across the upper and back part of the pharyngeal cavity, between the two eustachian tubes, a considerable mass of this tissue exists, and has been named the pharyngeal or luschkas tonsil. (Gray.) In a normal state this pad or tissue should at least leave enough space for the free passage of air from the nose to the larynx without calling upon the mouth to perform a function nature little intended it should do. Corresponding to the thickness of this pad or abnormal additions to same, so is this absolutely necessary breathing space curtailed, thus leading as a primary cause to more pathological effects and defects than any other one cause in the entire category, of a nature whose character is directly dangerous to health and life, as well as producing deformities, easily remedied if taken in time; lasting throughout life in spite of treatment, if not.

My plea and excuse for this paper is not to tire you with anatomical details, but as to method of handling these cases with the least degree of injury to the patient or parts involved or near by; the dispatch with which it is done, and the satisfaction as to ultimate results when the after treatment is carried out. Ordinarily one is led to believe that adenoid tissue in the naso-pharynx hangs in this space in a way that an instrument, such as Gottstein curette, will snugly fit and cut away in a manner that will afterwards need no repetition of the procedure, but the facts are, that this hyperplastic mass is not situated nor found in any two cases exactly alike. To follow a fixed rule as to position of instrument is simply waste of time. We may find upon diligent examination a soft pulpy mass occupying anything from a localized spot to filling entirely the naso-pharynx, feeling like a mass of soft liver tissue. This is more the case the younger the patient. As they get older this comparatively soft mass changes. The softer elements are absorbed or thrown off and what remains are roughened, lobulated or corded folds of hyperplastic tissue, fibrous in character. It is claimed by Trautmann that adenoid tissue continues growing until the third year, the tendency being to shrink after puberty.

From what I have seen of these cases I am led to believe the condition does not form after birth, but is there from previous to being born and simply increases in size, as Trautmann says, until the third year, this increase being corresponding to whatever element, heredity, inflammation or irritations may present, these irritations resultant from eruptive fevers, etc. We should consider the many pathological conditions set up by these vegetations—for instance, impairment of hearing and mouth breathing, leaving out hundreds of other equally important direct sequelæ. Kyle claims if this condition is allowed to remain until the bony nasal framework has become firmly united, then the removal will not increase nasal respiration other than by lessening the engorgement of the submucosa, subsequent to such obstruction, and this fixity of the bones of the face may leave the individual a confirmed mouth breather. This but emphasizes the importance of an early diagnosis and removal. It should certainly be done within the first three years of the child's life. Today and every day there are thousands of little children having nose sniffling, nose catarrh, serous and purulent discharges from the ears, etc., having the individual nose or ears treated regularly and faithfully by the physician, the family, or both in conjunction, for months, when in the great majority of cases of this kind time could be saved, suffering for the little ones alleviated and general satisfaction be felt by both the parent and attending physician, if the cause would be gotten at in the naso-pharynx, instead of losing time upon the individual organs, which are showing outward manifestations that are merely results and effects. Mothers say, "Doctor, when I was a child we did not have these things. I never had my throat touched and I am now strong and healthy." There is more truth than poetry in this, and is in a way due to the fact that the present generation of children seem to have less resistance, have weaker constitutions, are all the more prone to catarrhal conditions than the ordinary children born at the time our parents and ancestors were. Be that as it may, the fact is that now the great majority of children that it falls to the lot of the throat specialist to see

and examine, are mouth breathers, either asleep or awake, and if the adenoid tissue is not removed they simply do not develop, are stunted in growth, the facial expression is entirely changed, they become hollow chested, pale and anæmic. Neither will I go into details in regard to how the symptoms can and do manifest themselves, but let me assure you our text-books do not exaggerate them in the least. If you are in doubt as to the importance of this subject, watch one of these little patients before and after operation, and note the changes nature brings about when there is a cessation of violating her laws. The most skeptical may receive an object lesson which will last them a lifetime. Enough as to conditions, and a word as to method of removal after diagnosis has been established.

The cut and dried rule seems to be summed up in the following: Chloroforming and curetting with an instrument made for that purpose—the kind of instrument according to the preference of the operator. At times there have appeared articles by different writers in advocacy of the use of the index finger alone or protected by a metal contrivance fitting over its first phalanx, forming an artificial finger nail, and with this finger, protected or otherwise, not only making the exploratory examination but at the same time removing the growths entirely, at the one sitting. This is the method I advocate and always do. The orifices of the eustachian tubes are not the same distance apart in every child, so no fixed rule can be laid down to secure the curette operator from injuring one or both, even should he be lucky enough to get all the tissue with his instrument, which he will rarely do, as the instrument will not mould itself to fit the growth. On the contrary, in advocating the use of the finger alone in all cases, without exception, I do so because of repeated failures to get complete satisfaction by the method generally advocated. (Chloroform and the Gottstein curette or adenoid forceps.)

We have in the index finger, where the nail has been allowed to grow until it has formed an ideal curette, a means by which the operation is done more quickly, thoroughly, and in every way

more satisfactorily than by any other means at our command. Of course the finger must be treated in very much the same manner as the instrument would have been—in other words, made aseptic —and it would be better, if practicable, to make the parts to be operated on as clean as possible. The child sits in a chair with a towel pinned around over the chest and a small basin held in the lap or near by, with a few small towels or napkins to be used to free the nose of blood clots after operating, the mouth gag held in the hand not operating; the operating finger introduced in the post nasal space, and in one minute at the most everything removed in throat cavity that should not be there, without injury whatever to the orifice of the eustachian tubes or anywhere else. This procedure is severe for just sixty seconds—all must be completed after the introduction of the finger. No child will be inclined to allow you to attempt a second trial when the operating hand has been once removed from the mouth. After the operation is over the patient's head is bent forward and the blood allowed to flow freely, as it will do, and clots gently blown from the nose. When the slight shock of the operation is over, then an astringent application (I prefer some salt of silver) is rubbed in the parts on a cotton tipped applicator. If this is not done daily for a week or so, quite a quantity of new tissue will spring up on the base laid bare with the finger nail, and here I believe we have the cause for reaccumulation of tissue afterwards, where an operation has been previously performed and left to take care of itself. This application of an astringent seems to cicatrize and cause to heal bared bases from which the mass has been removed, and as the patient grows older this tends to shrink even more, giving eventually all the space necessary to a proper functionating of these parts. With chloroform you need one or two assistants—you have an hour or more work. The little patient is placed head inclined downwards, but even thus placed must breathe, so more or less blood is drawn in the larynx. You have the generally broken up appearance after recovery from the anæsthetic, etc., and providing everything goes all right there will enter a slight element of danger in chloroforming

even a child. All or most of these conditions are obviated by the method advocated here, and I venture, once tried, the first named method of doing this work will soon become obsolete, as far as that operator is concerned.

DISCUSSION.

DR. W. A. HARPER, Austin: This question of removing adenoids in the naso-pharynx is one that the general practitioner, as well as the specialist, should know something about. As regards the giving of chloroform, I think it is very rare that it is necessary to give chloroform to remove adenoids. I think a mistake is often made by not treating the parts after the removal of the adenoids, as Dr. Warfield brings out, after operation.

I can not add anything to what the doctor has said in his paper, to which I listened with a great deal of interest.

DR. J. C. LOGGINS, Ennis: As a general practitioner, there is one point in the doctor's paper that I want to endorse very positively. In trying to remove adenoids with the finger, it is unsafe, unless you use the mouth gag, for if you are operating on a boy three years old without the mouth gag, you will soon find that you are being operated on also.

DR. W. A. RAPE, Victoria: I want to know if the doctor gives the anæsthetic in the sitting posture, or did I understand the author of the paper to say that he did not administer an anæsthetic for adenoid operations in children?

DR. CLARENCE WARFIELD: I do not favor the giving of anæsthetics to children for this operation.

DR. JOHN T. MOORE, Galveston: I speak from the standpoint of the general practitioner with reference to adenoids. I have enjoyed listening to Dr. Warfield's paper. I think he has chosen a very interesting subject, and it occurs to me that this subject is left too much with the specialist, and it leads me to say that we fail to recognize this condition largely because we do not make a careful examination of our patient. I have now for the last three years made it a rule to examine the nose and throat of most cases that come into my office, and in many cases I have been surprised to find adenoids that had been treated for other conditions. We, as general practitioners, are at fault when we fail to equip ourselves to make these examinations, whether we care to do this work or not. I do not agree that it belongs to the specialist, but I think he can do this work very much better than we, as he is ordinarily better qualified than the general practitioner. I do not see any reason why a well equipped practitioner can not do this operation, and in the manner as Dr. Warfield has

described, with perfect safety, always bearing in mind the total and complete removal of these growths must be done if we want good results. I do not think that adenoids can be removed in every case in this way. There are cases in which they can not be removed with the finger; forceps or the curette must be used. It has occurred to me that the difficulty of sterilizing our fingers is an important one. Our fingers are put in all sorts of places and may become contaminated, and especially these finger nails that are allowed to grow long to act as a curette. I think that there are cases, and the specialist will agree with me, that nothing short of a complete removal, under anæsthesia, will do any good. It has been my fortune, or misfortune, to see a number of these cases where the finger was used, in which the adenoids were not completely removed. It may be, as Dr. Warfield suggests, that the treatment following the operation, in regard to astringents not being followed out, added largely to their recurrence.

With reference to diagnosis: The general practitioner should be so well trained at the school of medicine that he attends that he can recognize these adenoids and can do the operation. He ought to be prepared to do it. I believe in sending many of our cases to the man who is doing that sort of work continually, for they can do it better than we. But let us, by all means, see that our medical schools do teach us enough so that we, as general practitioners, can make out these cases, and have them treated properly.

DR. HENRY C. HADEN, Galveston: Dr. Warfield has chosen a very important subject for his paper. What he says in regard to the effect obtained by the removal of adenoids is true. The almost immediate relief from symptoms which often follows is seemingly marvelous.

I must, however, disagree with him as to methods of treatment of this condition. I do not believe that the pharyngeal wall can be thoroughly cleansed of adenoid tissue by curetting with the finger nail. I consider that the cases in which the growth returns are those in which it had not been originally completely removed. It is useless to depend upon astringent applications to complete its removal.

I also believe that no satisfactory operation for this purpose can be performed upon children without the use of a general anæsthetic, and that that anæsthetic should be ether. It has been shown by statistics that a great per cent of deaths from chloroform have been in those possessing adenoids, or excessive amount of lymphatic tissue.

Ether, I believe, is safe, provided it is administered by a competent anæsthetist. The patient should be thoroughly under the influence of the anæsthetic, for one is more likely to have a bad result if the patient is

permitted to recover from the influence of the ether and struggle, making it necessary to again and again to give more ether.

If the anæsthetic is carefully administered, and the position of the patient is correct, the blood will not enter the larynx. The patient should be in a recumbent position, the head well thrown back and the body slightly elevated. If this precaution is observed and the throat is sponged, the blood will be made to flow through the nose and mouth. Of course it is necessary to sponge rapidly, and a good assistant is of great help. One of the objections stated to the use of a general anæsthetic is that it necessitates an assistant. I consider that the advantages gained by the use of an anæsthetic, and the character of the operation, warrant the employment of an assistant. The choice of instruments lies in a sharp cutting one, such as the Gottstein curette, not one size alone, but three or four different sizes, and a small part of post-nasal forceps.

With a rapid movement, the central mass may be removed and as a result the patient may be relieved of all symptoms for the time. Later on, in many instances, although relieved of mouth breathing, other manifestations occur, such as excessive secretion in the vault of the pharynx, and middle ear disease. This is because of the lack of thoroughness. After the large portion of the tonsil is removed, the finger should be entered into the pharynx and search made for pieces of tissue, which may lie above the eustachian tubes, or extend down into the fossæ of Rosenmüller. When located, these should be removed with one of the smaller curettes. It may be necessary to re-enter the pharynx a number of times before it is entirely clean.

I am sorry to differ so radically from Dr. Warfield, but it is not with him alone but with other men of experience, who hold the same opinion.

DR. CLARENCE WARFIELD, San Antonio: I have tried to confine myself to the title of my paper; it was "The Removal of Adenoid Tissue in Children." While we have children over three years to operate on, most of the work that I referred to was done upon children before the third year. They are brought to the specialist generally, because they complain of some suppurative condition going on in the ear, which will not stop with the ordinary home remedies that are always used. I mentioned in my paper that as they grow older, the softer mass becomes absorbed and the fibrous portion of it becomes more manifest. When you find in an adult adenoids in the naso-pharynx, you invariably find that it is of the fibrous character, and nine time out of ten you find a thick, hard mass located in front or beneath, to form the back of the posterior section of the naso-pharynx. But when you take a child around the third year (between the first, third and fifth), how many times do you find a fibrous mass there? In place of such you find a soft, bloody, bleeding bunch of grape-like

tumors. I have kept a memorandum of one hundred cases in small children, and do not know in a single instance of anything that I could not remove easily with my finger without any special trouble as far as detaching the mass from the posterior wall was concerned.

I do not speak of this as though it has to be; I merely state my experience. I simply know that when you have children coming to you with suppuration of the ear, nose and throat stopped up, probably nasal discharge; if you will just take your finger, clean it thoroughly—and you can clean it thoroughly, for while it is true our fingers are into everything, so are our instruments—now, just suppose you used your fingers in place of your instruments, when you are preparing for and during a delicate operation in the abdomen, where you did not desire any infection, so it is just as safe to go into the post-nasal space, and infinitely more so, as the danger of infection is not the one-hundredth part as great as in the abdominal cavity, where you have absorption going on so quickly, and where you may have to cover your original wound. If you can make your finger clean enough to go into the abdominal cavity, you can, with safety, go into the post-nasal space as I said.

I never use chloroform, and do not use it in children, because I have never had to; never had any trouble in getting thorough satisfaction, and after suppuration of the ears, when you have removed the mass, the nasal discharge and nasal turgescence in children most always cease.

I draw my conclusions from the fact that most of the patients resided here, where I could watch them and test them. There were probably one or two exceptions where I have had to remove a little of it again, and with those it has been because of not applying the astringent to contract and draw it in upon itself.

In regard to chloroform, or the use of an anæsthetic; if I remove from an adult, I do not use an anæsthetic; I find that the hard fibrous mass naturally can not be removed with the finger, so use the necessary instruments with a child; however, where you find one case of a hard tumor you will find a thousand with a soft, pliable mass, and it is about children I am talking, not adults.

SECTION ON DERMATOLOGY.

DHOBIE ITCH.

CHAS. F. MASON, M. D., U. S. A.,

FORT SAM HOUSTON, TEXAS.

The term, "dhobie itch," and the diseased condition to which it is applied constantly confront us in the tropics. The name is applied by the laity to almost any form of itching skin eruption in the axilla, groins, or upon the feet, and the word "dhobie," which in India means "laundryman," indicates the popular belief, more or less well founded, that the disease is spread through the filthy habits of this indispensable member of society. Certainly when those habits are considered there is ground for the belief; washing the clothes as he does in cold water without boiling, and then spreading them upon the ground to dry, might seem sufficient, but in the Philippines, at least, it is not unusual for the *boy* to wear your underclothes a time or two before he brings them back. There are at least three distinct forms of skin disease occurring in the regions indicated, which are commonly known as dhobie itch. Two of them are mycotic, those due to the *microsporon minutissimum* and to the *trichophyton,* and one bacterial *pemphigus contagiosus.*

These diseases are very widespread in the tropics and often cause a considerable amount of suffering and discomfort. The germs, growing on warm, moist surfaces, such as the crutch, axillæ, and feet, causes intense irritation and itching, so that especially at night the patient can not sleep; the scratching leads to abrasions, and these becoming infected, to boils and small abscesses, so that the patient often can not walk, or even dress himself. With the advent of the cool season the irritation subsides somewhat, and upon return to a cold climate the disease disappears spontane-

ously, to sometimes reappear under favorable conditions. It has been introduced into the Southern States of this country by soldiers returning from tropical service and will no doubt soon become endemic among us, especially when clothing is not laundered by boiling. There are constantly cases under treatment at this post.

The diagnosis and treatment will depend upon the type of the disease, whether mycotic or bacterial, and must therefore be considered under separate headings.

Pemphigus Contagiosus.—This very contagious disease, which always prevails very widely among our soldiers on first going to the Philippines, is characterized by an eruption, most marked in the crutch and axillæ, of vesicles about the size of a pea or larger, these vesicles springing from an uninflamed base, and unattended by fever or other constitutional disturbances. The fluid of the vesicles, at first clear, soon becomes turbid, about which time the vesicle is ruptured or dries up, leaving a smooth, pink, glazed surface with an edge of epidermis more or less undermined. The eruption gives rise to considerable irritation, the successive crops of vesicles running into each other and rendering the parts raw and sore.

It is distinguished from chickenpox by its distribution and the absence of constitutional symptoms, and from the mycotic dhobie by the freedom from rings, and the absence of mycotic elements as demonstrated by examining scrapings under the microscope.

The treatment consists in thorough cleanliness of the parts and of the underclothes, sponging the affected region twice a day with solution of bichloride of mercury, 1/1000, which is allowed to dry, and then followed by dusting with a powder containing equal parts of zinc oxide, boric acid and starch.

Mycotic Dhobie.—The diagnosis is easily made by observing the festooned rings with raised margins, and confirmed by finding the tricophyton elements microscopically in the scrapings. Sometimes however, when there is much inflammation these elements can not be found even when they are undoubtedly present.

The treatment consists first in keeping the parts clean and dry;

then there are several medicinal agents which are almost specific; they should be thoroughly applied once or twice a day to the edge of the rings and a little beyond, and to all the new spots. Sometimes it is necessary to first shave a hairy part. In my experience the following agents are effective in the order named: Tincture of iodine, glacial acetic acid, 5 per cent chrysophanic acid ointment, 10 per cent salicylic acid ointment, 1/500 alcoholic solution of corrosive sublimate; the last is the most painful.

DISCUSSION.

DR. BOYD CORNICK, San Angelo: I want to know whether the two cases originated in or outside of this country. That is, was the disease brought from the Philippines or Cuba, or did it develop here?

DR. J. T. MOORE, Galveston: I have a case practically like the one described by Dr. Mason, but did not recognize it.

I certainly thank Dr. Mason for presenting this case to us, and I think our contributions on this subject ought to be encouraged. I believe if we were to make systematic scrapings in all skin lesions, that the general practitioner would have fewer cases to send to the skin man.

REPORT OF A CASE OF LICHEN RUBER.

JOHN W. KENNEY, M. D.,

SAN ANTONIO, TEXAS.

Lichen ruber, though not a rare disease, is not common. It will probably not form one per cent of the skin cases treated by the general practitioner. Though divided into several varieties by many dermatologists, the identity of each is questioned by many others. A careful clinical study of any variety will always reveal a blending with another, a fact that forces some to believe that the so-called different varieties are in reality only a difference in virulence, the same difference being evident in all manner of disease.

To the present-day practitioner four things are evident regarding lichen ruber: (1) It must have appealed to the lexicographer through its red color; (2) to the dermatologist as a papulo squamous disease; (3) to the patient as an intensely irritating affection; (4) to the general practitioner as an extremely obstinate disease, sometimes presenting grave constitutional symptoms and perhaps death. These four points form the chief characteristics of the disease. The painful fissures at times found where the skin folds upon itself, the infiltrated skin, the furuncles and loss of hair and nails are only found in cases that have been much neglected. These latter symptoms would likely appear in the obstinate skin disease if allowed to progress without hindrance by treatment.

The following report of a case treated by me during the past six months illustrates the various phases of the disease better than any theoretical description:

Patient was a retired farmer 59 years of age. His constitution leaned toward the strumous. Had always considered his lungs a weak point. The first symptoms of his present illness appeared August 5, 1901, while in Oklahoma attending a town lot sale. The itching on face and extremities became very annoying. This, he

supposed, was due to the sand and dust and he sought relief by washing himself in some stagnant water near where he was located. The disease continued to get worse. He returned to his home, tried many remedies, visited Marlin and Mineral Wells and took baths at both places. Failing to get relief he came to the San Antonio hot wells and took a few baths, which aggravated his disease. September 25, 1902, he called at my office and placed himself under my care, saying that he would give me a two weeks trial. At this time he had eighteen boils scattered in an irregular manner all over him. Both arms for several inches above and below his elbows on flexor surfaces were covered with furfuraceous crusts and itched intensely; left side of abdomen was red and covered with papules. Beneath the knee joints the skin was red and fissured. A like condition was found in front of each ankle. The eyebrows and lashes were falling out and the skin of face was thickened and red. Many papules and infiltrated spots were noticeable. Peaceful sleep was unknown. Pressure of the lightest garment or the slightest exercise caused intense itching and burning. It felt good to scratch and he instinctively tried to feel good all the time. He scratched while asleep, while walking about and all the time when not thinking of my instructions to not scratch at all.

After reviewing the history of the case and taking into consideration most all manner of local and tonic treatment had been tried in vain, it was decided to adopt a systematic mode of treatment. Accordingly alkaline baths were given daily to cleanse the skin. To remove the furfuraceous matter and rough, red skin from the affected parts an application of pure carbolic acid was made. This was, of course, quickly followed by alcohol to remove the escharetic effects of the acid. Only a few days were needed to show that much good came from these applications.

Hypodermic injections of bichloride of mercury were given for their alterative effect, for their germicidal power and to relieve the apparent septic condition of the patient as evidenced by the boils, etc. The treatment caused steady improvement in the patient's general condition. The boils gradually disappeared and the

patient took on flesh. Relapses occurred often, but each was much more mild than its forerunner. The infiltrated skin, fissures and papules also gradually disappeared. Today there is but little left to tell of the patient's former miserable condition. The injections were given daily with the exception of perhaps one month up to the present time. The bichloride was administered in 20 mms. of a 2 per cent solution of phenol. This prevented all pain or inflammatory reaction from the mercury. The patient has now been allowed to return home with the advice that he continue the treatment until all trace of the disease has disappeared. The most difficult part in the management of this case was the control of the itching. All antipruritic remedies did good for awhile but soon lost their efficacy. That the itching should be relieved is self evident. It causes the patient to scratch and thereby inoculate himself with septic matter. It produces loss of sleep and consequently a nervous condition that makes life almost unbearable. So irresistible is the inclination to scratch that often the patient does not realize the harm he is doing until a raw surface is produced. These abraded surfaces are extremely difficult to heal. Perspiration, which appears whenever the patient becomes irritated, causes these raw surfaces to be very painful. To relieve this the patient will sit with some absorbent in his hand waiting to remove each drop of perspiration as it appears. This naturally adds fuel to the fire in so far as permanent relief is concerned.

To relieve this condition adrenalin chloride was applied locally and atropine sulphate administered internally. These were used as often as necessary to give relief and acted fairly well, better than anything else used in this case except the hypodermic injection of morphine sulphate, this latter being only resorted to when the pain and excessive nervous state of the patient demanded that he be given at least temporary rest and ease. The administration of an opiate is objectionable if frequently used, not only on account of the liability of the patient becoming an habitual user of the drug, but likewise because it locks the emunctories and thereby delays the elimination of the poisonous matter that undoubtedly saturates the

patient's system. Used occasionally, however, it is very beneficial —in fact in the above case it was indispensable, as it was the only drug that would give complete rest. Not as an aid but equally as important as any of the above treatment, is a proper observance of the ordinary laws of health. Bowels and kidneys should be kept active and the diet regulated in so far as it is possible.

A recent letter from the patient cited in this paper stated that all the old lesions have disappeared but that he still has, now and then, a little trouble in a new territory. In spite of these continued slight relapses no one knowing the Job like condition of the patient in the beginning of the treatment can for one moment doubt that ultimately he will be entirely relieved of his distressing affliction.

SECTION ON PATHOLOGY.

CHAIRMAN'S ADDRESS.—THE ADVISABILITY OF A MORE DEFINITE COURSE OF INSTRUCTION IN PHYSICS IN THE MEDICAL CURRICULUM.

ALLEN J. SMITH, M. D.,

GALVESTON, TEXAS.

I would preface the matter of argument principally in mind in presenting this address by calling attention to a mental attitude very common in medical students, the aptness to regard the mere gaining of a diploma as the summum bonum of a course of study—a habit of thought which unfortunately is capable of being carried forward into the medical practice of the physician in viewing the possession of a diploma as justification of whatever of lack of skill and practical inefficiency may be exhibited in his professional life. There are, of course, many exceptions to the unfortunate truth of such an assertion; but in the minds of those accustomed to deal with large numbers of medical students the reality, however it may be regarded, of the first part of this proposition can scarcely fail of recognition; and it needs no long search in the great body of our profession to find ample evidence of the second. In fact there lies at the bottom of these mistaken purposes and opinions so much of common human nature, so many of the temptations of an artificial strenuosity of life which has never more than now prevailed in our country, that indeed it is matter for wonder that such faults of preparation and evasion of responsibility in action are not more numerous than they really seem.

Granted the truth of such statements, it naturally follows that in the mental processes of individuals of such type there should be exhibited the equally faulty wish and effort to obtain the desired

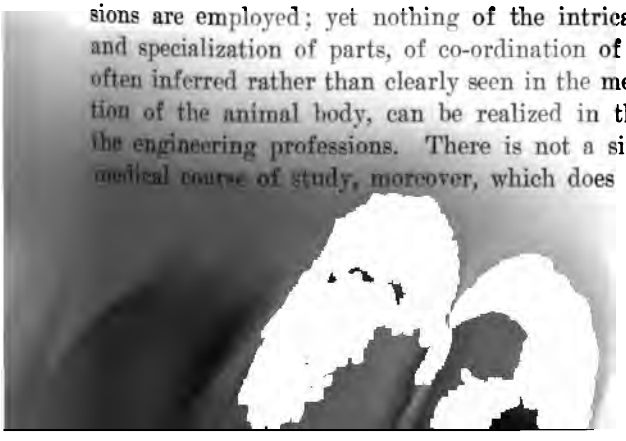
diploma and such license as it may afford at the least possible expenditure of energy, time and other valuable conisderations; and in whatever feature of preparation for medical practice there appears opportunity for evasion of difficulty, of conservation of mental effort and temporal and financial convenience, in that phase of the educational course of the individual such evasions are likely to be practiced. Naturally, too, in those subjects of the curriculum which do not on their face bear evidence of their immediate relation to future professional requirements are likely to be concentrated these attempts at evasion; and thus it comes to the untrained, unadvised or ill advised student of medicine that he should regard all his studies and exercises dealing with the so-called preliminary branches of medical training as unproductive, relatively valueless and undesirable, and justly to be neglected when opportunity obtains.

Of the branches of the medical curriculum or preparatory to it which in the experience of the writer are regarded by this type of student as veritable bugbears, physics, chemistry and general biology probably occupy the first rank, and probably among themselves stand in the order given. That there are reasons for the widely prevalent views of this sort among our classes is not, of course, to be doubted; and it is not at this time or in this paper my aim to recognize and discuss such reasons. Moreover, I do not wish in the present writing to attempt to show reason for insistence by medical instructors upon thoroughness of study in each of these branches of science by our classes. Both chemistry and biology seem in fair state to prove to even the most unthinking their absolute necessity to the really competent physician; and in fact need neither defense nor laudation. Chemistry at one time shared with anatomy in its all pervading dignity in the medical curriculum, but rather from its relations with the compounding of remedial agents than with either physiology or pathology. With the division of labor between physician and pharmaceutical chemist the older value of chemistry grew less and less in the appreciation of the first; and eventually had it not been for its ancient predomi-

nance and the value of occasional applications in symptomatology (especially of the urinary diseases) it would doubtless with botany have been entirely relegated to the pharmaceutical curriculum as non-important to the medical man. But here, as in all human habits of thought, there is a pendulum swing now carrying back to its old prestige the study of chemistry, changed, it is true, in the type of its presentation and application, but each year recognized more and more in the form of physiological and pathological chemistry as one of the undeniable and main supports of our best medical knowledge. It is safe to say that within another generation physicians who are not also competent chemists will occupy just as little advanced position in the profession as do those now who are incompetent microscopists. The widespread interest in nature studies, reaching well down into the lower grades of our common schools, is sufficient assurance of the final position which general biology, at least as a preparatory branch, must bear for those who look forward to a life in medicine.

It is no great wonder that ancient and mediæval physicians were not also physicists as they were chemists when we recall the crude ideas and limitations of the general subject until comparatively modern times—the really modern establishment of such basic ideas as the true relation of the earth in the solar system, the rotundity of the earth, the law of gravitation, the control of electricity, the mechanics of steam, the conservation and transformation of energy, the vibratory theory of force and a host of cognate matters, to say nothing of the discovery of the circulation of the blood, the cellular structure of the body and the cellular theory of disease.

In the manifold applications of the principles of physics in modern every-day human life men of a score of specialized professions are employed; yet nothing of the intricacy of construction and specialization of parts, of co-ordination of each to the whole, often inferred rather than clearly seen in the mechanism and function of the animal body, can be realized in the entire group of the engineering professions. There is not a single branch of the medical course of study, moreover, which does not in recognizable



way and degree call forth, directly or by analogy, the fixed principles of physics as clearly as in any engineering problem. The architectural ingenuity of man is barely comparable if at all to that shown in the adaptation of material for strength in the construction of bone, in the distribution and limitation of strain in the human skeleton; the principles of hydrostatics and hydronamics with the system of compensations witnessed in the circulations of the body are applied with more intricacy and exactness than seen in the highest engineering accomplishments in connection with any of the waterways of the globe; the development and co-ordination of gross and minute movements of the body and its parts exhibit a desideratum for mechanical engineers to be envied but not to be attained; the production and maintenance in uniformity of the body temperature in all the varying conditions of the body itself and its external relations in comparison with our best artificial means of heat production and regulation are as more than the work of the master to the work of the child; the complexity of the factors of physical and chemical processes operative in secretion and excretion renders the actual method almost a sealed book to the physiologist, but no man's machine is inscrutable to his fellows; the simplicity, convenience and effectiveness of the ocular and aural apparatus render our eyes and ears models to be approached but not attained by the ingenuity and skill of human inventors and mechanics; while the vast system of nervous paths and centers of the animal body may have an analogy in the most complex electrical arrangements of men, the whole world of electric systems compacted in one mass can scarcely rival the delicacy, multiplicity and infinite accomplishments of the nervous apparatus of one human body.

That a branch of science having such elaborate relations with the animal body in health and in disease should find little and often no definite representation in the medical curriculum is from the first serious thought in itself marvelous. Perhaps the complexity of its bearings in medicine and the profundity of its relations in life phenomena stand as a first excuse for this most significant

failure. Let this be so; it is no argument. Even Alexander's little world was not conquered in a day. No matter the magnitude of the whole, each part apprehended is a gain to human knowledge and somewhere has its practical application; part by part, every portion fixed upon the student's mind makes of him one better prepared to work out further problems for himself and for the rest of us. Nor am I unaware of the fact that these principles are here and there at the present time being given in one or another of the existing branches of medical study; but a part here and another there are by no means the same as a careful and definite resume of the science and its scope of application to our needs; and further, those branches now working out these problems as from time to time needed in elucidation of their own difficulties are in so far doing preparatory work from which there is every reason to excuse them if we would wish them their fullest development in a speedier time. The ophthalmologist before his class goes over a course explanatory of the physics of light and lenses; the microscopist prefaces his instruction by a somewhat similar outline; the aurist discusses the vibrations of air and solids in the transmission and development of sound; the physiologist the diffusion of gases, the laws of osmosis, questions of hydrostatics and hydrodynamics and practically every other subject pertaining to the branch in the explanation of a great number of instruments of precision and in elucidating that which is known and conjectured as to the various bodily functions; the obstetrician the resultants of forces applied variously, successively and co-ordinately in directing and accomplishing the birth of the child—in short, each instructor takes up before his class some part or parts of a subject of fundamental importance to all and deserving an individual and dignified position in the scheme of instruction, and each loses just so much of his time and opportunities to press a little further toward his assigned object in the general plan.

What would I make of physics in the medical curriculum? To the writer's mind the branch has a direct and particular phase of application which is spoken of as *medical physics*. For the stu-

dent who has had training in the subject when admitted to the medical school I would insist upon a course of lectures or text-book study with actual demonstration covering the general principles, and for all students laboratory exercises designed to familiarize them with the principles and actual manipulation of the various instruments used in experimental and in practical medicine and to illustrate by experiment and attempts to mechanically reproduce outside the body by simple models such phases of nature's operations as may thus be copied. The latter part of the scheme. the distinctively medical physics, should be further elaborated according to the wish and ability of the instructor, by lecture or other mode of explanation, in indicating the multiplicity of factors and their mutual relations in the accomplishment of bodily functions, and with immediate and direct reference to the influence of modification or loss of any factor toward the development of disease and its symptoms.

The matter of the construction and mode of handling of the various instruments used in experimental and practical medicine needs no explanation or illustration of its value to the student; and the release of the instructor from the necessity of discussing fundamental principles involved in his branch will doubtless be accepted as affording more chance for increased attention to and development of the particular features of his special subject. Dealing with those students who have attained the general ideas and a fair technique, the physiologist, the pathologist and particularly the clinical physician and surgeon or obstetrician have fair field for presenting the final problems of their branches, the ultimate objects of instruction. There is no part of the course of medical education free from such problems; but I may choose several for the sake of illustration which occur as I write.

The student is taught that glandular secretion or excretion is dependent on the presence in the gland of more or less freely circulating blood as the source of the particular substances elaborated by the gland. He witnesses *a case of acute renal suppression* in the hospital ward and later at the autopsy meets with a deeply con-

gested, red and swollen kidney. Will it help his appreciation of the development of the symptoms if his thoughts be directed along some such line as follows? Setting aside for the time, but in no way denying the importance of selective cellular activity, the physical forces and methods involved in urinary excretion are brought forward in greater prominence. The structure of the kidney speaks for filtration as at least one factor in renal activity, filtration of the fluid and more or less of the urinary salines from the blood. For the example in hand it is immaterial what further action the epithelium of the convoluted tubules may accomplish. One may well compare the renal unit (the malpighian tuft and its enveloping capsule and the tube leading therefrom) to a separator funnel lined with a permeable membrane and fitted with a compressible discharge tube. My meaning may, perhaps, be more readily apprehended by reference to the diagram (Fig. 1) in which is represented an ordinary separating funnel, within which, separated by an appreciable space from the inner surface of the funnel is fitted a permeable and expansile membranous sac (a), provided with an entrance tube (b) and exit tube (c), both of the same expansile type as the sac itself, and the exit tube (c) coiled about the compressible discharge tube (d) of the funnel. In a rude way this follows the type of the coiled capillary tuft within Bowman's capsule and the arrangement of its emergent capillary about the convoluted tubule of the kidney. Presuming that the pressure of the fluid within the membranous sac in the funnel (capillary tuft within Bowman's capsule in the kidney) is marked but insufficient to stretch the sac to close adaptation to the wall of the funnel the contained fluid will escape through every part of the membrane into the space between the sac and the funnel; and if that pressure be lowered the filtration of fluid will be disminished in rate. On the other hand, if the pressure within the sac is increased (increase of vascular tension in the renal vessels as in marked congestion), it follows that the sac must expand to become closely applied to the wall of the funnel (the tuft to the wall of Bowman's capsule); whence it is clear that there is opposition to the escape of the fluid

from the sac save at the limited surface opposite the opening of the discharge tube of the funnel (the beginning of the proximal convoluted tubule of the kidney). It is to be realized that increased pressure within the sac must be carried forward along its emerging tube (c), leading to the distension of the latter (providing the same difficulties of discharge as in the tortuous renal capillaries and veins), in this connection the particular feature of its expansion referring to its encirclement of the discharge tube of the funnel (the plexus of emerging capillaries about the convoluted tubules and the general capillary distension within the renal mass). If room for such distension is not given save at the expense of the caliber of the encircled discharge tube (as is the case in the kidney from the pressure of the general renal tissue and the resistant renal capsule) there must result narrowing or possibly closure of the discharge tube, affording another mechanical factor in inhibiting whatever tendency toward filtration may continue in the funnel above; and if the pressure be sufficient through these two obstructions one may readily infer total suppression of the filtration process. The walls of the capillaries of the malpighian tuft are by no means entirely comparable to ordinary porous filtration membranes, but in the relation here proposed are at least analogous and in illustration of the mechanical influences named will easily bear comparison; and silence concerning any part played by the renal epithelium in no wise impairs the illustration. Nor is it difficult to fix in the same bit of apparatus the ideas of the student as to the relation of urinary suppression and hæmaturia in such cases of renal stagnation from congestion.

Another striking example from pathology suggested by the same line of thought concerns the explanation of the posture assumed by the patient with broken cardiac compensation and approaching his end. It is invariable that as the heart fails the individual finds himself little by little forsaking his natural low recumbent posture at rest, seeking a higher and higher pillow, and as death approaches finding comfort only in a sitting posture, with the limbs more or less elevated; and invariably change from this position

to a lower or higher (more erect) attitude calls forth evidences of special cardiac effort. There are here of course, as in most cases, a number of factors to be considered for the full explanation of the whole symptom picture; but of these that of the influence of gravity in distribution of the blood is the element of variation to which mainly must be attributed the symptoms in question. One should realize here that in the erect or sitting posture the column of blood in the aorta and its branches beyond the turn of the aortic arch must by its weight naturally produce no immaterial tendency toward keeping up the usual downward current (other factors of aid and resistance being disregarded for the time for the sake of the argument; while in the recumbent position the distribution of the blood over the whole body is practically the result of the propulsive force of the heart and vessel walls alone. The difference in cardiac labor in these two postures may be roughly stated as the difference in lifting the column of blood from the left ventricle to the turn of the aortic arch and to the head in the first instance and the lateral propulsion of the whole arterial blood mass in the second. Or, to use a homely simile, it is comparable to throwing a ton of coals, shovelful by shovelful, over a fence and allowing it to fall fifty feet in a vertical direction in one case, and in the second instance to the labor of transporting the same coals, shovelful by shovelful, across a level space for fifty feet and depositing it in a new heap. With such a view it is easily realizable that there is more labor demanded of the heart with the body adjusted in recumbent position than in either the erect or in the sitting posture, and that when the circulation is from many influences already weak and feeble, the added strain upon its walls may well call out marked evidences of its exertions. The sitting posture is assumed rather than the upright in such an instance for easily stated reasons, namely, the usual general muscular enfeeblement of the individual and (in the absence in either position of chance for free muscular and respiratory aid in venous return) the less labor of lifting the venous column of blood through the shorter vertical from the feet to the right heart when the individual is sitting than when stand-

ing. This, too, should explain the common tendency in such patients to keep the limbs moderately elevated when sitting, such elevation being insufficient to occasion much difference in the gravitation of the column of arterial blood but making an important difference in favor of more easy venous return from the limbs (the difference of height of the lower pelvic level and the floor).

These examples of the type of questions to be presented to the student in medical physics are crudely and but incompletely drawn; but they serve the purpose of illustration here desired and indicate the objective aim in urging the adoption of a definitive course in the subject. They are both well suited to actual laboratory demonstration, but not more than a host of other possible instances. In fact, in the arrangement of a course it must be a matter of selection from the great number of examples possible; and the fullest scheme could not possibly deal with more than types, leaving the individual applications to the intelligence and resources of the student for determination. It could not do more than attempt to inculcate a habit of thought along these lines, aroused by witnessing typical illustrations; and in the end this is one of the real purposes of every education—the establishment of a method of observation and of mental reflection and application of principles to the clinical problem of the physician. Beyond this, the crowded condition of the curriculum would give but little justification for fuller work.

This matter of urging the adoption of a definite system of instruction in medical physics applies particularly to our American medical schools. For a decade or more in Great Britain it has come to be a required study for those applying for the ordinary qualifications; but in the university courses in medicine and surgery it was demanded for a much longer time. Much the same may be said of the continental universities as for those of the British. In our own country a demand for a certain amount of knowledge of elementary physics as an entrance requirement is common to all the schools holding membership in the American Medical College Association as well as to a number outside this organization. For the most part this requirement is worth nothing, or very little bet-

ter; in some instances the branch is but an elective in these requirements. In comparatively few college catalogues is the amount fixed at any really important grade. Inspection of catalogues show, too, that in but a very small minority of our schools is there provided any additional work in the medical aspects of the subject; and of these few it is not at all sure in some but that the physics taught is absolutely elementary and rather introductory to chemistry, with which it is usually associated, than an applied medical physics. There are a very small number of American schools in which the catalogues indicate a really commensurate and suitable presentation of the branch, and this number by no means includes all of the schools of the highest reputation in the land. Nor does there occur to the writer, in examining the prospectuses of the year or from personal knowledge or information obtainable, that there is any real tendency to remedy what after serious thought he has come to look upon as an unjustifiable negligence.

I confess to a twofold object in this sketchy presentation of what I fear is not a popular subject. The first is of course that of attracting the interest of the members of the Association to the importance of medical physics in itself and to its rather common disregard in most of the American schools of our profession; but I have more directly in mind the intimate relations of this Association to the State and its medical school. In the Medical Department of the University of Texas no preliminary knowledge of physics is asked the student about to matriculate. From early in its history the professor of chemistry, Dr. S. M. Morris, has devoted in the first half of the Freshman year two hours weekly to a lecture and demonstrative course in the subject with special reference to its bearings in medical study, but has been unable, principally from lack of space and appropriate equipment to develop the actual and needed laboratory course above suggested. It is unlikely that it will be possible for years to come to demand such degree of preliminary knowledge of the subject that it might be dropped from the[illegible]ere this desirable; since entrance demands from pro[illegible] must in distinct degree depend on as well as lead

popular education. It is toward the establishment of a fuller, more practical and more directly medical course in physics in our home school that in closing I wish to leave your thoughts, in which wish I know the ideas of my colleagues in the faculty of the school and my own are in accord; and for which I am in position to know that the Regents of the University, advocates of progress wherever and whenever possible, are powerless, as in many other features of the school where advances and expansions are desirable, solely because of financial disability. I would not ask of you any concerted action in any of these matters, since such action is apt to be transient in its influence and of less value than individual effort; but I would ask of those of you to whom this paper may have appealed as reasonable to use your personal powers and influences to create in our State a popular interest in and willingness for the school to advance, not only in the limited lines indicated in this paper, but in all lines leading to the highest attainable efficiency.

THE FERMENTATION THEORY OF INFECTION AND IMMUNITY.

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"He that thoroughly understands the nature of ferments and fermentation shall probably be better able than he that ignores them, to give a fair account of divers phenomena of several diseases (as well fevers as others), which will perhaps be never properly understood without an insight into the doctrines of fermentation."—ROBERT BOYLE (essay on the "Pathological Part of Physik").

In 1828, when Wöhler synthetized urea, modern physiological chemistry was born; and at the same time it was demonstrated beyond a peradventure that the peculiarities of organic substances are the result solely of the properties of carbon, their chief constituent. From that day until this, it has been more and more clearly demonstrated that the so-called vital processes are but highly specialized chemical and physical phenomena, such as are daily encountered in our laboratories. The recent work of Loeb, which carries into the realm of physiology the work of Van Hoff, Arrhenius and others, is a gigantic stride in the demonstration initiated by Wöhler. It is attempted in this paper to follow in the footsteps of the masters in so far as the principles of molecular physics are utilized to explain certain quasi-vital phenomena.

NOTE.—The principles of molecular physics, involved in the explanation of fermentation by the author, were utilized by him as far back as the 80's to explain the mysterious action of medicine on the living organism; and in 1890, in an abstract of a paper on fermentation, immunity, and infection, read at an annual meeting of the American Medical Association, these same principles were held to underlie the phenomena of these processes. In 1892, this subject was more fully elaborated in a small volume, which was published by the author, entitled "Fermentation, Infection and Immunity."

That the phenomena of fermentation and of infection and immunity are strictly analogous processes, and that these analogies point unerringly to a common causation, has been recognized for more than three hundred years; yet the common cause has heretofore remained a mystery. It is the purpose of this essay to present an explanation of those phenomena based upon accepted theories of molecular structure and molecular energy.

Fermentation, broadly speaking, is a chemical or chemico-physical change induced in certain substances by specific bodies, themselves unchanged, and resulting in specific products. These change-inducing bodies may be divided into (a) living ferments, and (b) non-living enzymes. In a narrower sense the term "fermentation" is applied merely to changes induced by living ferments; while the term zymolysis or zymosis is reserved for that produced by enzymes. Living ferments are micro-organisms which are widely distributed in nature, including many bacteria, blastomycytes and some moulds. Enzymes, or non-living ferments are bodies which are formed within living cells of animals or plants of the higher order of life. The two classes of ferments present many points of similarity in their action; for example, both classes work best at practically the same temperature, about that of the normal human body; both are destroyed by boiling, either will cause insoluble substances to be transformed so that they pass into solution; each is hindered, and may be arrested, in its action by the products of its own activity; neither adds anything from its own substance to the ferment products; and each manifests selectivity, in that a definite structural relation must exist between the ferment and the fermentable substances in order that fermentation or zymolysis may take place. "We know that the properties which are supposedly characteristic of the enzymes are possessed also by certain elements which are found only in the inorganic world. The most notable property of the enzymes is their ability to effect an amount of change which is out of all proportion to the quantity of the enzyme present, and the fact that the enzyme itself apparently does not enter into the reaction. These properties, however, are com-

mon to certain metals and their oxides. Bredding and Von Bermaik showed that a gramatomic weight (193 grams) of colloidal platinum diffused through 70,000,000 litres of water shows a perceptible reaction on more than 1,000,000 times the quantity of hydrogen peroxide; and H. C. Jones demonstrated that the reduction that here takes place is a monomolecular reaction. Curiously enough, the analogy between the action of such metallic solutions and that of the enzyme goes further. Finely divided platinum, palladium, iridium, osmium, etc., thus have the power of inverting cane sugar, like one of the enzymes—invertase; and certain poisons, such as hydrocyanic acid, sulphuretted hydrogen, carbon disulphide and mercuric chloride, which inhibit or even suspend the action of the enzymes entirely, exert a similar influence upon the solution of colloidal platinum." (1)

Unfiltered grape juice, when set aside in a containing vessel under favorable influences of temperature, will soon undergo fermentation. The grape juice, at first clear, will soon become turbid and actively agitated by escaping carbon dioxide. Physical and chemical changes take place. Microscopically, it may be seen to contain numbers of ferment cells; chemically, it shows that the grape sugar has in considerable part been destroyed, and that an entirely new substance, alcohol, has been produced. Finally, when the process of fermentation has ceased, there may yet remain sugar in the fermenting fluid capable of being decomposed, and ferment cells capable of decomposing it. Alcohol, the principal product of vinous fermentation, is the substance that causes this arrest of fermentation. It stands, as it were, between the sugar on one side and the yeast cells on the other, prevents the one from decomposing the other, and is therefore an antibody to vinous fermentation. Remove the alcohol, and fermentation again begins; and it again ceases as soon as the requisite per cent of alcohol has again accumulated. Thus the process may be continued until all the sugar is decomposed, or it will be permanently arrested by allowing the alcohol to remain. In the latter case the wine fermented is

the sweet variety; when the sugar is entirely decomposed, the variety is a sour wine.

The chief points of difference between the two classes of ferments are indicated by the names *living* and *non-living*.

Living ferments are living cells which have the capacity of growing, of assimilating, of reproducing, of decomposing, and of transforming fermentable substances into ferment products; enzymes, or non-living ferments, can neither grow, assimilate, nor multiply themselves, but they possess, in common with the other class, the capacity of decomposing and transforming fermentable substances into ferment products.

It is a well established fact that the capacity of a living ferment to do specific ferment work, that is, to bring about the decomposition of fermentable substances and the recombination of the dissociated atoms into ferment products, can be modified so that the specific activity of the ferment can be increased or decreased temporarily or permanently at the will of the operator; or by natural causes. And it has been further shown that these modifications do not visibly influence the cell in its vital characteristics, and that qualities thus acquired may be transmitted by the cells to their progeny. The cell will continue to grow, to assimilate, and to multiply itself as before, notwithstanding that its capacity to do specific work will have been modified more or less permanently, or totally destroyed, and this modification may be transmitted by inheritance. It will appear from these facts that the vital or vegetative functions of a ferment cell are quite different from those which give the cell its capacity to do specific ferment work.

It was shown by Pasteur, and later confirmed and more fully worked out by Hansen, that a pure culture of ferment micro-organism is necessary in order to secure purity in saccharifierous fermentations. The quality of beer, for example, has been greatly improved by methods in securing pure cultures of the required ferment. More recently "Emil Fischer has, by purely chemical research resulting in his celebrated work on the synthesis of sugars, on the use of phenyl-hydrazin and on the azone reaction, diverted

the current of views on fermentation pehenomena into new channels. His researches led him to explain the behavior of yeast towards the particular sugar of the nutritive liquid in the same way as the action of the enzyme (invertase emulsin) so that the chemical activity of the living cell does not differ from the action of chemical ferments.

According to Fischer the fermentation of polysaccharides is always preceded by the hydrolysis of sugar. *But there exists an exact relation between the molecular structure of a given sugar and the sugar inverting enzyme of the yeast cell; if the sugar comes into contact with the albuminoids of the yeast cell, which play the most important part among the agents of which the living cell makes use, the sugar is decomposed only if the configuration, the geometrical structure of its molecules, does not deviate too much from the configuration of the molecules of the albuminoids."**

Furthermore, Buchner has recently shown that the juice obtained from the yeast cells by hydraulic pressure is capable of quickly fermenting highly concentrated sugar solutions of various kinds, even after it has passed through a Birkefeld filter. He infers from his experiments that the fermentative power of the expressed juice is embodied in a soluble enzymelike substance isolated from the living cell plasma.

However, it has been demonstrated repeatedly by independent observers that a vessel filled with unfiltered grape juice and divided into two parts by a thin layer of cotton wool, shows active fermentation only in that portion in which yeast cells are introduced. Since such a partition is incapable of prohibiting the free passage of soluble enzymes, we must conclude that the direct contact of the yeast with the fermentable substance is necessary. In other words, it has been shown that the active cause of fermentation is a substance which is not normally thrown off by the cells, but which may be extracted from them by destroying the inherent properties of the cells, including their vitality. That the function

*Italics author's.

of vitality is not identical with that of fermentation is proved by the facts of attenuation already mentioned. I conclude, therefore, that the active ferment is not a secretion of the ferment micro-organism, but is an inherent property of the cell which may be destroyed, but not extracted without destroying the vitality of the micro-organism.

It may be well to keep in mind the fact that the products of fermentation inhibit the activities from which they result. Alcohol, for example, inhibits vinous fermentation, when its accumulation in the solution has reached a definite combination. When this equilibrium is reached, *the sugar is immune to the activities of the yeast cell, and alcohol is the immunizing agent.* This is not a phenomenon characterizing vinous fermentation alone, but is, on the contrary, common to all fermentations. Nor is it a chemical combination between the factors involved, but must be a physical equilibrium (if I may use the term), because of the fact that the removal of a portion of the alcohol results in fermentation again becoming active until the requisite percentage of alcohol has again accumulated.

INFECTION AND IMMUNITY.

The phenomena of infection and immunity have been so thoroughly discussed in recent literature that it becomes unnecessary to do more than mention the more characteristic features of these processes.

INFECTION.

Infection may be defined as that condition of the body resulting from the entrance and the multiplication of micro-organisms which cause to be produced organic poisons whose effects upon the organism are the symptoms of disease. The introduction of pathogenic products alone may cause symptoms and lesions of infection, but the resulting condition in this case is not communicable; as the presence of living pathogenic microbes is necessary to the possession of this latter quality.

The following characteristics are possessed in common by patho-

genic and ferment micro-organisms. (1) They are specific in their activities. (2) The power possessed by ferment micro-organisms to produce specific ferment products is manifested by pathogenic micro-organisms as a power to produce specific pathogenic products; but the results obtained with either species of micro-organism, ferment or pathogenic, will vary with the environmental conditions of heat, soil, light, etc., under which the micro-organisms are placed. (3) With both species the capacity of the micro-organism to do specific work, as fermentation in the one instance and pathogenesis in the other, may be modified, lessened or increased temporarily or permanently, without visibly changing the vital characteristics of the micro-organism whereby it lives, grows, assimilates and propagates. (4) It has been shown that the function of cell vitality, of both species of micro-organisms, is not identical with the capacity of the cell to do specific work—ferment or pathogenic—and that the latter function is an inherent property which can be variously modified or destroyed by natural or by artificial means, but which can not be extracted without destroying the vitality of the cell. (5) The products of cell activities—ferment and pathogenic—are inhibitory substances, antibodies, which tend by accumulation to arrest the processes of which they themselves are the results.

IMMUNITY.

Immunity of an organism to infection may be an acquired or a congenital condition. Once acquired immunity may be partial or complete, temporary or permanent. The means of defense against infection which an organism acquires is not the same in all cases. In one form of acquired immunity the organism is capable of neutralizing the toxins, antitoxic immunity. In another form of immunity the organism is able to destroy the invading bacteria, antibiotic immunity. In another form of acquired immunity the protection enjoyed by the organism is due to conditions which prevent the production of toxins in its tissues by a species of pathogenic bacterium. This form I will call somatic immunity. But since

immunity of the organism, whether this be congenital or acquired, partial or complete, transient or permanent, antitoxic, antibiotic, or somatic, is an ability of the organism to resist infection, we should not lose sight of the important fact that there is a necessary and intimate causative relation between the bodily condition of the organism which predisposes to infection and that condition which resists infection; and further, that an explanation of one of these conditions will serve to also explain the other condition.

Observers who have attentively studied the phenomena of immunity are convinced that the albumins of the living organism, especially those of the blood serum, play an important and necessary role in the production of this state. Von Fodor first called attention to the possession by the blood plasma of a vital element which kills micro-organisms introduced in the living organism. Emmerich and Mattea first maintained that these antibiotic substances are the result of the bacteria themselves, but after further observations concluded that they are formed by the living cellular elements. Flugge, Nutall, Nissen, and Buchner described a bacteria killing substance which was present in the blood of immune animals, not only while it was circulating in the vessels, but also after it had been withdrawn and had practically undergone coagulation, the serum being separated from the corpuscles. It has been shown by Petruschky that the blood serum, freed from cellular elements, of animals immune to anthrax killed anthrax bacilli, and by Nutall that the aqueous humor, the ascites fluid, and other body juices also possessed similar but somewhat feebler antibiotic powers.

"This capacity, however, has its limits. If one inoculates more than a certain number of micro-organisms some will be killed, but for the survivors the serum, instead of remaining a hostile element, becomes a source of aliment and the bacteria begin to increase on it."

"The germ killing, disinfecting power lies exclusively in its plasma; the cellular parts of the blood, the red and the white corpuscles, even counteract and paralyze it. Under the influence of high temperature it quickly disappears; it is also diminished by

the blood being left standing for a length of time, but repeated freezing and thawing does not affect it."

"Buchner and Nissen see a connection between this peculiar property of the serum and the processes which contribute principally to its coagulation. This, however, does not tell us much about the exact nature of the active principle. However, in a subsequent series of investigations Buchner found that the germ killing power of serum depends on the salts which it contains; a diminution of the saltiness being accompanied by a diminution of the power to kill bacteria. Buchner subsequently claimed that the salts are of importance only because they stand in intimate relation to the albuminoid matter of the blood, the quantity and quality of which is decisive, and turns the scale one way or the other. The salts serve as solvents or agglutinants to the albuminates and an altogether special, peculiar, and as yet unexplained condition of the serum albuminoids is the active cause of the bacterial killing agency." (3)

Pfeiffer found that cholera bacilli, when placed in the peritoneal cavity of a guinea pig immune against the disease, were soon dissolved by the peritoneal juices. Later investigations have shown that this is not an exceptional instance but applies to a large number of conditions, and that the reaction obtained in each case is specific in that it occurs only between immunized sera and the species of micro-organism concerned in the production of the immunity. For example, when several species of micro-organisms were introduced at the same time with the cholera the serum acted only on the cholera bacillus, the other species not being affected.

It has been shown by Erlich, at an earlier date, that the inoculation into susceptible animals of certain vegetable poisons of the nature of enzymes—ricin and abrin—when used at intervals in small but in progressively increasing doses, will cause the development of antibodies in the blood serum of the animals treated, and that such sera possess not only immunizing powers, but are capable of curing a beginning of infection.

The great discovery of antitoxin by Behring, Kitasato and Roux,

and the more recent advances in our knowledge of the blood serum, may all be regarded as outgrowths of Erlich's valuable work with ricin and abrin. Mention can here only be made of recent biological work of the utmost value by Bordet (4), Fisch (5), Ulenhuth (6), Leclainche and Vallee (7), Nutall (8), Wasserman and Schultze (9), Metschnikoff (10), Von Dungern (11), and others, which has greatly broadened our knowledge of the capacities of blood serum to adapt itself, by the development of specific antibodies, to foreign cells, cell products and cell derivatives of the most diverse character. It is safe to assert that within the cycle of changes which occur in the albumin molecule (whereby it adapts itself to, and protects the organism from, the influence of foreign cells, their products and derivatives) there lies concealed the mystery of infection and immunity.

Are the metabolic changes which there take place vital, as held by Metschnikoff; chemical, as held by Erlich, or are they physical, as held by me?

PHENOMENA OF IMMUNITY.

"One of the most astonishing facts observed in physiology and pathology is the resistance which certain animals show to the invasion of their bodies by the germs of disease."

"Thus man suffers from typhoid fever, cholera and other infectious diseases which are never observed in the domestic animals; cattle are subject to pleuro-pneumonia, which does not affect their attendants; man, the cow, and the guinea pig are peculiarly susceptible to tuberculosis, which the cat, dog and horse resist; yellow fever is a highly contagious infectious disease which is most certain to attack all new arrivals of the same species when epidemic, but which rarely if ever attacks animals."

"The popular mind accepts the statements of such facts without any other explanation than that the animals are different; but the more the scientific man contemplates them, the more complicated the matter becomes; for while it may be admitted that a difference in the body temperature and chemistry might explain why a frog will resist anthrax, which readily kills a white mouse, it will not

explain why a house mouse, whose chemistry may be almost identical with that of the white mouse, can successfully combat the disease. Nor is this all. That one attack of yellow fever, of typhoid fever, or of scarlet fever renders a second attack almost impossible is not the less interesting because of its every day observation. The mouse that had recovered from tetanus will not take tetanus again, and most interesting and extraordinary is the fact that a few drops of blood from the recovered mouse injected into another will protect it from tetanus." (16)

Having examined the fermentative processes, including infection and immunity, let us turn our attention to the chemical and physical laws to which the factors involved in these phenomena are subservient. A particle of albumin or of sugar may be conceived to be divided until further division would disrupt the substance into its constituent elements. This smallest possible particle, carrying inherent characters of sugar or albumin, is known as a molecule of the substance, and consists of various particles of carbon, hydrogen, oxygen, etc. These latter particles, which are the smallest conceivable particles of matter, are known as atoms. There are as many kinds of atoms as there are chemical elements, and as many kinds of molecules as there are substances differing chemically. It is a generally recognized fact that one of the msot distinctive characters of atoms is the property of specific motion—that is to say, the same kinds of atoms are characterized by the same kinds of motion, while different kinds of atoms have different motions. The fact that each element, when in a gaseous state, absorbs all the rays emitted by the same element in an incandescent state and only those rays, demonstrates according to modern physical theory that each kind of atom possesses its specific motion, which is a function of the wave length absorbed. The gas may be condensed or the atoms combined with other atoms in various chemical combinations, but upon isolating the original atoms, the same absorption phenomena are observed, notwithstanding the fact that these specific absorptions may have been, for the time, obscured. Maxwell says: "Molecules (atoms) exist of various kinds, having their various

periods of vibration either identical or so nearly identical that our spectroscope can not distinguish them. The same kind of molecules (atoms), that of hydrogen, has the same set of vibrations whether we procure the hydrogen from water, from coal, or from meteoric iron." (17) In other words, physical science teaches that atoms are not only in constant motion, but also that such motion characterizes the atom moving; as, for example, all hydrogen atoms have the same sort of motion, likewise oxygen atoms, nitrogen atoms, etc.; each kind has its own definite vibration period. Lord Kelvin's vortex hypothesis not only attributes to each kind of atoms its distinctive motion, but also hypothecates that the motion of the atom is the sole character which distinguishes it from other kinds of atoms.

Molecules are, in general, collections of atoms held together by the little known force called chemical affinity.

To explain the phenomena of the universe, we must recognize the presence of a continuous universal medium that pervades all space—the luminiferous ether. This medium, which serves to connect all bodies, such as molecules and atoms, also receives and transmits their motion through space as ether waves; spectrum analysis is based upon this physical law.

We furthermore learn from physics that ether wave motion, like water and sound waves, are subject to the beautiful law, discovered by Dr. Thomas Young, the author of the undulating theory of light, called the "Law of wave interference." Sir John Herschel says. "This principle, regarded as a physical law, has hardly its equal in beauty, simplicity, and extent of application in the whole circle of science." (18)

When two sets of water waves whose troughs and crests corresound in time of recurrence meet, their amplitude will be increased —the dimension of the resulting waves will be enlarged; *vice versa*, when the periods of wave recurrence do not correspond, but the troughs of one set correspond with the crests of the other set, the resulting waves will be quenched, destroyed. Similarly, waves of sound and waves of sunlight will be intensified, quenched or

modified in various ways by other sound or light waves according to the amount of interference that exists. This is a simple if crude illustration of the law of interference, and serves to illustrate how atomic and molecular ether waves may be influenced by the same agency.

The following remarks by Professor Tyndall are apropos in a discussion of this subject: "A group of atoms drawn and held together by what chemists term affinity is called a molecule. The ultimate parts of all compound bodies are molecules. A molecule of water, for example, consists of two atoms of hydrogen, which grasp and are grasped by one atom of oxygen.

When water is converted into steam, the distance between the molecules is greatly augmented, but the molecules themselves continue intact. We must not, however, picture the constituent atoms of any molecule as held so rigidly together as to render intestine motion impossible. The interlocked atoms have still liberty of vibration which may, under certain circumstances, become so intense as to shake the molecules asunder. Most molecules—probably all—are wrecked by intense heat, or in other words, by intense vibratory motion; and many are wrecked by very moderate heat of the proper quality. Indeed, a weak force which bears a suitable relation to the constitution of the molecule can by timely savings and accumulations accomplish what a strong force out of such relations fails to achieve.

"The sensation of light is produced by a succession of waves which strike the retina in periodic intervals; and such waves impinging on the molecules of bodies agitate their constituent atoms. These atoms are so small and, when grouped to molecules, are so tightly clasped together that they are capable of tremors equal in rapidity to those of light and radiant heat. To a mind coming freshly to these subjects the numbers with which scientific men here habitually deal must appear utterly fantastical; and yet to minds trained in the logic of science, they express most sober and certain truth. The constituent atoms of molecules can vibrate to and fro millions of millions of times in a second. The waves

of light and radiant heat follow each other at similar rates through the luminiferous ether. Further, the atoms of different molecules are held together with degrees of varying tightness—they are timed, as it were, to notes of different pitch. Suppose, then, that the light waves or heat waves impinge upon an assemblage of such molecules, what may be expected to occur? The same as when a piano is opened and sung into. The waves of sound select the strings which respectively respond to them—the strings, that is to say, whose rates of vibration are the same as their own. Of the whole series of strings these only sound. The vibratory motion of the voice imparted first to the air is taken up by the strings. It may be regarded as *absorbed,* each string constituting itself thereby a new center of motion; thus also as regards the tightly locked atoms of molecules on which waves of light or heat impinge. Like the waves of sound just adverted to, the waves of ether select those atoms whose periods of vibration synchronize with their own periods of recurrence, and to such atoms they deliver up their motion. It is thus that light and radiant heat are absorbed.

"I have spoken of molecules being wrecked by a moderate amount of heat of the proper quality; let us examine this point for a moment. Let a quantity of the vapor of nitrite of amyl be introduced into a wide glass tube along its axis. (Prior to the entry of the beam, the vapor is invisible as the purest air.) When the light enters, a bright cloud is immediately precipitated on the beam. This is entirely due to the waves of light, which wreck the nitrite of amyl molecules, the products of decomposition forming innumerable liquid particles which constitute the cloud. Many other gases and vapors are acted on in a similar manner. Now the waves that produce decomposition are by no means the most powerful of those emitted by the sun. It is, for example, possible to gather up the ultra-red waves into a concentrated beam, and to send it throught the vapor, like a beam of light. But though possessing vastly greater energy than the light waves, they fail to produce decomposition. Hence the justification of the statement already made, that a suitable relation must subsist between the molecules and the waves of ether to render the latter effective.

"I have stated without proof, that where absorption occurs the motion of the ether waves is taken up by the constituent atoms of the molecules. It is conceivable that the ether waves, passing through an assemblage of molecules, might deliver up their motion to each molecule as a whole, leaving the relative position of the constituent atoms unchanged. But the long series of reactions represented by the deportment of nitrite of amyl vapor does not favor this conception; for, were the atoms animated solely by a common motion, the molecules would not be decomposed. The fact of decomposition, then, goes to prove the atoms to be the seat of absorption. They in a great part take up the energy of the ether waves, whereby their union is severed and the building material of the molecules are scattered abroad." (19)

When considered in the light shed upon the subject by the fermentation theory, the term molecular structure ceases to be a meaningless name, the source and nature of cell energy becomes more intelligible, and the yeast cell no longer appears a structureless mass of enclosed protoplasm, but a machine of great complexity and capacity; we mentally behold a countless number of atoms in orderly arrangement within the molecules of the cell, vibrating in time and periods that are distinctive, and imparting their own motions to the surrounding ether within the molecules.

We further mentally behold a wondrous conflict of the atomic ether waves produced within the molecules which, in harmony with the law of interference, finally results in an adjustment of the conflicting waves, and in the production of a set of ether waves specific in character and which represent the molecular structure of the cell.

The adjusted waves are the resultant of the following factors: (1) The kind of atoms comprising the molecule; (2) the particular manner in which the atoms are grouped, constituting molecular structure; and (3) interference of atomic ether waves. The set of ether waves resulting from an adjustment by interference of the atomic waves we will call molecular ether waves, and as they represent molecular structures, they will, consequently, vary in

their distinctive characters with variations in the structure of molecules. Ether waves possess energy, hence molecular ether waves represent molecular energy which necessarily varies in character with variations in molecular structure.

The energy of a cell, say a yeast cell, will then be the sum of the energy of its contained molecules, provided the molecules are the same in structure. Excluding from our calculation the cell molecular groups that are directly concerned in the vegetative operations of the cell, it will be more accurate to say that the energy of a yeast cell is the sum of energy possessed by its molecular groups which are concerned in bringing about fermentation. It necessarily follows as a corollary of these principles that the distinctive energy possessed by cells of various kinds, as bacteria and ferment cells, is a result in each case of distinctive molecular structure of the cell.

It should be noted that the distinctive or special energy of a cell, or of an enzyme, as pointed out by Emil Fischer, is manifested as a capacity to produce certain changes in those substances only which bear a definite relation in molecular structure to that of the ferment or enzyme concerned.

Now the exact relation in molecular structure of the ferment and the substance which Fischer describes as "configuration," and "geometrical structure" of the molecule, is, I hold, a similarity in molecular structure of the two bodies, and, therefore, a similarity in molecular waves and energy. In other words, the molecular waves of the sugar and yeast cell (or enzyme) bear a definite relation in time and periods of recurrence, so that the waves of two sets when they meet are intensified and the energy of the resulting waves is increased, possibly doubled. Under this wave influence the substance which is the least stable in chemical bonds—the sugar—is disrupted. The ether waves falling millions of times per second upon the sugar molecules, which vibrate in accord with the disrupting waves, are dissociated by the wave energy of the yeast.

Atoms which have just been freed from their chemical bonds, as in this instance, can not long remain in a nascent condition;

chemistry teaches that they must immediately recombine into other simpler substances. This is the condition of the sugar atoms—they have been driven from their combination and must recombine according to chemical law. We must keep in mind the fact, however, that in entering into new combinations the atoms are seriously handicapped, as they must recombine against the energy of the ether waves that dissociated the sugar. It seems evident that no substance whose molecular structure is identical or too nearly identical, with that of the particular sugar dissociated can form under the bombarding energy of the waves, as the energy which is capable of dissociating is also capable of preventing combinations of such substances.

Among the various substances into which the dissociated atoms may combine only those whose molecular waves are not in accord with the molecular waves of the yeast are possible under this influence. It will be noted that a substance which is not in accord with yeast is not in accord with the wave energy of sugar, and it will oppose both. The substance is therefore an antibody to vinous fermentation.

We have spoken of "accord" and "discord" or "dissonance" of ether waves to express certain relative phases of the waves. Waves that are in accord recur in the same periods of time, their troughs and crests correspond. Discordant or dissonant waves do not recur in the same periods of time, and the troughs and crests of one set do not correspond to but may oppose the troughs and crests of the other set. While such expressions are descriptive of water and sound waves they may not be applicable to ether waves, but they serve the purpose intended, that of making clear the relations between ether waves, which I desire to explain.

We have already learned that ferment products are inhibitory bodies whch tend to and in their accumulation do arrest the fermentation. Do we not find an explanation of this mysterious inhibition phenomenon in the conditions under which these bodies are formed? Alcohol, for example, inhibits vinous fermentation, of which it is the principal product. We have seen when alcohol

accumulates in vinous fermentation that this process will be arrested, when the accumulation of alcohol reaches a certain definite per cent. There may be unfermented sugar, and yeast cells ready to ferment it, but no fermentation will take place while the percentage of alcohol remains. *The sugar is immune to the activity of the yeast cells, and alcohol is the immunizing agent, because its wave energy opposes that of the yeast and sugar;* it is therefore an antibody.

Stahl, 1707, is entitled to the credit of having first formulated a theory of fermentation and putrefaction in which the causes producing the phenomena are purely physical agencies—molecular disturbances in the fermenting fluids. This conception of the nature of fermentation was adopted by Liebig, 1842, who held that the molecular disturbances which bring about fermentation are motions of decay which are imparted to molecules of a fermentable substance by the molecules of the albuminous substance undergoing decomposition. (20) The molecular disturbances which cause fermentation are, according to Naegeli, 1852, the physical motions of atoms and molecules characteristic of these bodies. The author's theory, while it is an outgrowth of that of Stahl, of Liebig, and of Naegeli, differs from these in important ways. For example, I hold that decomposition is caused, not by direct bombardment, atom against atom, and molecule against molecule, of the ferment upon the fermentable substance as taught by Naegeli's theory, but that the conflict by bombardment which results in a dissociation and recombination of the fermentable substances into ferment products, is between ether waves, atomic and molecular, produced by and corresponding to the motions of the atoms and molecules. The potential energy of the cell, say a yeast cell—that is, the capacity of the cell to do special ferment work—is a result of its structure, and is a reflex of its molecular ether waves. This potential energy of the cell becomes active or kinetic energy only when its waves meet in conflict with the waves of another substance, say sugar, which the former can decompose and transform into ferment products, alcohol, etc.

THE FERMENTATION THEORY OF INFECTION.

Infection and fermentation, I hold, are analogous processes or phases of the same process, and both are due to the operation of the same physical and chemical laws. The active, obvious cause in both processes is a micro-organism or an enzyme, which is selective in its activity in that a definite relation in molecular structure must exist between the acting substance and the substance acted upon before infection or fermentation can take place. The resulting products of the process, whether they be infectious or fermentative, are antibodies which tend to inhibit or to arrest the process of which they are the products.

The substances which pathogenic micro-organisms select to transform into the toxins of disease are the albuminoid molecules of the body plasma. "The albumins of proteids are the most important foodstuffs which animals require for their existence. Albumins enter into the constitution of all tissues and organs of the body and form the groundwork of every living cell. The phenomena of life, indeed, are dependent upon, and center in, their presence.

"With few exceptions the foodstuffs, which the animal derives directly or indirectly from the plant, can not be utilized by the animal directly, but they must previously undergo certain changes, which vary with the character of the individual substances. The native albumins must first be transferred into albumoses and peptones; the dissaccharids and polysaccharids must be inverted into monosaccharids, and the fats must be emulsified. We have seen in the chemical laboratory that these changes can, for the most part, be brought about through the action of superheated steam, by boiling with acids and alkalies, etc.; that is, through agencies that are not at work in the living world. The question, therefore, suggests itself, what are the means at the disposal of the living animals to bring about these changes? This question has, in a measure, been answered—the animal capable of bringing about a large number of analytical changes by means of certain ferments or enzymes, which are furnished by the animal cells themselves.

The better known representatives of this class are essentially hydrolytic ferments, but there is evidence also of the existence of oxidation ferments.

"As the chemical processes which take place in the animal body are essentially of the character of hydrations and oxidations, it would thus appear that other factors besides the ferments would be unnecessary for the functioning of the various organs. It is quite possible, indeed, that this is actually the same, and that the various manifestations of life may be explained upon the basis of fermentative phenomena." (21)

Since the albumins of the tissue juices of the animal body constitute the pabulum from which its various tissues select nutritive substances required for their growth and the repair of their waste, the albumin molecules, using this term in the broadest sense, must exist in groups of many isomeric forms. And while these groups possess the chemical and physical properties of albumin, they differ among themselves in greater or less degree in molecular structure. This conception of the molecular structure of the pabulum not only affords an explanation how body tissues of different kinds appropriate from a common source and transform into their own substance nutritive materials of the pabulum, but it also supplies an explanation how various kinds of micro-organisms find in the pabulum albuminoid groups which they can transform into kinds of toxalbumins.

We must not overlook the fact, however, that the tissue juices of the animal body are essentially vital, and that the resistance of the molecules to decomposition is due to the same vital influence, probably of the nervous system, that resists destructive changes in the organism as a whole. This being true, groups of homologous molecules whose structure bears certain exact relations to the molecular structure of certain micro-organisms, will more or less successfully resist dissociation by bacteria, i. e., the animal body will resist infection by micro-organisms according to the degree of normal resistance that is possessed by the molecules, or by the organism. At the same time, depressing influences, such as

fear, fatigue, injurious drugs, emotional disturbances, etc., by diminishing resistance, open the road to infection.

PATHOGENIC MICRO-ORGANISMS.

A micro-organism is pathogenic to the animal body only when the latter contains molecules of albumin (proteid) which the former can transform into toxalbumins. Hence, a micro-organism may be pathogenic to one species of animal, whose tissue juices contain susceptible albumin molecules, and not pathogenic to another species or a variety of the same species of animal, whose body juices do not contain susceptible albuminoids. Immunity of the animal body to a given micro-organism or to the disease caused by that microbe, as will be explained later, is due to the absence by destruction or inheritance of molecules of albumin which are susceptible to the special energy of the micro-organisms of the disease. Such micro-organisms are therefore not pathogenic to this organism and they may remain in its tissues without producing specific disease.

A phenomenon that has proved a serious stumbling block to the phagocytic theory of immunity is the markedly different behavior of the phagocytes to pathogenic bacteria in the bodies of immune and of susceptible organs. In the immune animal the phagocytes flock to the point of invasion from long distances and attack and destroy the bacteria. The conditions are quite different when this same species of bacteria is introduced into the body of a susceptible animal; the bacteria are not now attracted by the phagocytes, on the contrary they are repelled by them, in that the phagocytes retreat and permit the bacteria to infect the organism.

Under former teaching, that the pathogenic power of a bacterium is due to a secretion of the microbe, it is difficult to explain this phenomenon, but when pathogenesis is recognized to be the result of two factors—a species of micro-organism and a group of susceptible albuminoid molecules, the absence of either factor will prevent infection, and since the immune animal does not contain a group of albumin molecules which the micro-organism can

transform into toxalbumins, infection can not take place. The micro-organisms under such conditions are not pathogenic and the phagocytes—the scavengers of the body—destroy them as they do other innocuous substances. In the case of a susceptible animal the conditions are quite different. The body juices of such animal do contain susceptible albumin molecules which the micro-organism can transform into toxalbumins. It is the presence of these poisons that drive away the phagocytes and lead to infection, while it is the absence of toxalbumins in the immune animal that cause opposite phenomena to occur.

In concluding our remarks upon the nature and causes of infection, I wish again to emphasize the importance of certain principles which, I believe, are causatively concerned in the phenomena of both fermentation and infection, and as will appear later, in those also of immunity.

The energy of a living cell, whether this be a ferment or a pathogenic cell, whereby the cell is made capable of doing special work, is derived from the ether waves which represent the molecular structure of the cell.

Since the manifestations of energy by living ferments and pathogenic cells are definitely associated with the molecular structure of such bodies, and since there are a vast number of species and varieties of both ferment and pathogenic micro-organisms, the capacity of such cells to do work, which varies in character with the species and the varieties, is a reflex in each and every case of molecular structure. In other words, the manifestations of specific energy by ferment and pathogenic cells, which vary with the species and variety of the micro-organism, is a result of specific differences in molecular structure of the cells of the different classes.

The specific energy of the living ferment or of the pathogenic cell is capable of converting into ferment or pathogenic products substances only whose molecular structure, that is, molecular waves, does not deviate too far from the molecular structure of the cell.

The energy of atomic and molecular ether waves is increased or diminished by related ether waves according to the degree of interference that results from their conjunction. When the waves of one set correspond in time and periods with those of another set, their conjunction causes an increase of wave energy; on the other hand, when the two sets of waves do not correspond in time and periods, but the waves of one set recur in periods directly opposite to the waves of the other set, the wave energy is apparently destroyed (quenched, antagonized) by conjunction of the two sets of waves.

THEORIES OF IMMUNITY.

The nature and causes of the various kinds of immunity have presented a problem which some of the ablest minds of the medical profession have vainly tried to solve. Pathologists, bacteriologists, biologists, physiologists, chemists, and general medical practitioners have all been represented in the army of workers in this important branch of medical science, and notwithstanding the vast amount of valuable experimental work that has been done, the candid observer is forced to admit that the various theories which have, from time to time, been put forward to correlate and interpret the chemical and experimental phenomena of immunity, have served more to puzzle the brain and to obscure the subject than they have to philosophically explain the phenomena. Probably the unconscious mental bias which results more or less from limiting study and experimental investigations to single lines of work, and which necessarily circumscribes the mental horizon of the observer, may be largely responsible for the obscure tangle into which the subject of immunity has been placed. It is believed the solution of this problem is to be found, if at all, not in the phenomena themselves, but in the laws of matter underlying and producing the phenomena.

Of the many theories of immunity but three have at present any considerable following. They are the humoral theory of Buchner and his associates, the cellular or phagocytic theory of Metschnikoff, and the side-chain theory of Erlich. According to the

humoral theory the destruction of pathogenic bacteria in the living organism is due to the bactericidal action of the blood plasma. Buchner and his school have shown that freshly drawn blood, blood plasma, defibrinated blood, aqueous humor, tears, milk, urine and saliva possess marked destructive influence upon micro-organisms brough in contact with them, and that this influence is destroyed by exposure to sunlight, the mixture with serum from another species of animal, and by heating blood serum to 55° C.

THE PHAGOCYTIC THEORY OF METSCHNIKOFF.

In 1881 Carl Rosser called attention to a power which the phagocytes of both animals and plants have of incepting, digesting and assimilating living micro-organisms; and he maintained as a result of his observations that leucocytes of an immune animal can destroy bacteria which are themselves destructive to susceptible animals. Metschnikoff, working on the same lines, confirmed the earlier observations of Rosser, and from observing what appeared to be a contest between the white blood cells of the water flea and certain infectious mcro-organisms, he was led to believe "that in every case of infection it is the white cell elements of the blood that, as scavenger cells (phagocytes) have to save the organism if they can. If bacteria attack any part of the body, these cells, favored by their mobility, at once appear at the place of danger and rush upon the invaders. If they are able to make the latter innocuous, no infection takes place; if, however, these defenders of the organism struggle ineffectually and yield, the enemies begin to multiply and spread themselves over the unprotected domain." (22)

As Carl Rosser first pointed out, "Phagocytes of an *immune* animal can destroy bacteria which are themselves destructive to *susceptible* animals." The phagocytes of the immune animal alone are capable of incepting and destroying the pathogenic micro-organisms of that disease to which the animal is immune. Conversely, when the same bacteria are inoculated into the same species of animal, but one which is not immune, the phagocytes do

not rush upon and destroy the bacteria, they cease to act as defenders of the organism; on the contrary, the phagocytes rush the other way and permit without opposition the bacteria to infect the organism, and if, perchance, a phagocyte should englobe one or more of the bacteria, they will surely destroy the phagocytes. Why phagocytes that destroy a pathogenic form of bacteria in immune animals are themselves destroyed by the same bacteria in susceptible animals, is a question that lies at the very base of the phagocytic theory and calls in vain for explanation.

The first attempt of the phagocytists to explain the phenomena of immunity rested upon the assumption that phagocytes may become so accustomed to pathogenic bacteria by being trained against attenuated forms of such microbes that finally they can successfully attack the virulent forms. This explanation was soon found indefensible for the reason that an animal may be made immune by inoculating it with sterilized cultures or with the toxins only, of the bacteria. In such cases the phagocytes of the animal have had no opportunity to become accustomed by contact with virulent or attenuated forms of the micro-organisms, as none of these were introduced, yet the phagocytes of the animal destroy the pathogenic bacteria when they are introduced with apparently the same ease and facility displayed by the phagocytes supposedly trained by contact with the foe. It was finally claimed by the advocates of this theory that the phagocytes are trained not alone against the bacteria, but also the toxins they elaborate, and will then not be repelled by such substances.

THE "SIDE CHAIN THEORY."

This theory of immunity is an outgrowth of Erlich's studies into the nature of toxins and antitoxins, and it expresses his views of the nature of the changes in the tissues and plasma cells of the body which take place in immunization. Of the many atom groups which compose cell structure certain permanent groups are concerned in maintaining and perpetuating cells, while other groups, called "side chains" or "receptors," which are supposed to be

multifarious in special chemical affinities and in numbers, are particularly occupied in cell nutrition. In the exercise of this function the "receptors" attract to themselves such nutritive material of the plasma, or toxins contained therein, which have special affinities for the "receptors," and through the intermediation of the receptors combine such substances with the cells. Now infection of the cells by toxins is produced, acording to Erlich, in the same manner and by the same agency that nutrition of the cell is produced. In this instance toxin molecules in the plasma, which have the required affinities, are seized by cell receptors, and through the intermediation of these bodies, the toxins exert their harmful influence upon the cells themselves.

Certain anomalous results obtained by Erlich in standardizing diphtheria toxin led him to conclude that the toxin molecule has two distinct atom groups, one of which is destroyed by exposure for a half hour to a temperature of 56° C., while the other remains active under this exposure. The thermo stable groups—the "haptophore groups" or simply the "haptophores" of the toxin molecule —are concerned chiefly in neutralizing the toxin, while the thermolable groups—called the "toxiphore groups" or simply the "toxiphores"—constitute the toxic part of the molecule. "Toxoids" are toxin molecules which have lost their "toxiphores" but retain their "haptophores." Erlich claims that the anomalous results he obtained in standardizing diphtheria toxin were due to the presence of toxids in the sera.

Now, as a cell can be reached by nutritive stuff or by poison stuff only through the intermediation of specific receptors, and as the function of these bodies is destroyed or much impaired when they become infected, they must be cast off and reproduced, when infected, or the cell must perish from starvation.

It is assumed, therefore, that cells which have not been destroyed by the toxin, but have sustained injuries which they have overcome, will cast off the infected side chains, and will replace them by new ones and in excess of the capacity of the cell to retain. The result of this excess in production of side chains is the appear-

ance of "receptors" in the blood stream as free bodies, and as they retain their combining powers, they may unite with homologous toxin molecules, and will thus protect the cells from further infection by the toxin, and will give to the animal body thus protected antitoxic immunity, the free receptors being antitoxins.

The following phenomena are apparently not in harmony with this theory of antitoxic immunity: "Guinea pigs and men who have withstood a tetanus infection and are very resistant may contain no tetanus antitoxin." (23) Rabbits which have been immunized to tetanus will succumb to an intercerebral inoculation of a small dose of tetanus antitoxin. (24) Many animals, such as rats, hens and alligators, after inoculation with tetanus toxin, produce great quantities of antitoxin without previously showing any signs of the disease. (25) Finally, in the production of antitoxin by toxin, say of diphtheria, the quantity relations of the toxin to the antitoxin in the process are those of a ferment and its products, rather than those between the factors of a chemical combination. A unit of toxin may cause the production of about 10,000 units of antitoxin; the production may be largely increased by repeated venesections of the immunized animal, so that there may be withdrawn a quantity of antitoxic serum out of all proportion to the quantity of toxin used; and yet, at the end, the animal can supply a serum of nearly the same antitoxic power as at first. This phenomena is strikingly like that which occurs in alcoholic fermentation when, by repeated removals of alcohol, arrested fermentation may be re-established and more alcohol produced. It seems that in both cases increased production following removal is due to weakening or destruction of inhibitory influences which tend, by their presence, to arrest the processes of fermentation.

Bacteriolytic immunity is due to specific lytic qualities which the blood acquires in adapting itself to infectious cells that are introduced into the body. It has been shown when various kinds of cells, their products or derivatives, are introduced into the peritoneal cavities of animals, at certain intervals, that the blood serum of the treated animals will undergo changes of the most exact and

delicate kind, and that there will be developed in the plasma antibodies to the bodies introduced. For example, the introduction at intervals of attenuated infectious cells into a susceptible animal will, in the process of immunizing the animal, cause the development of lysins in its body which are capable of destroying the cells introduced. If red blood cells are introduced, the serum of the animal treated becomes hæmolytic; when epithelial cells or hepatic cells or spermatozoa, are introduced the serum is lytic for the epithelial, the liver cells, or the spermatozoa, according to the kind of cells introduced. If pathogenic bacteria are introduced the blood serum becomes lytic for the bacterium. It should be noted that the relation between the cells introduced and the adaptive changes which take place in the blood serum of the animal treated, is exact and specific in character.

Erlich, in his side chain theory, offers the following explanation of these phenomena, which, of course, includes those of bacteriolytic immunity. He concludes that the lytic power of blood serum resides in the thermolable constituents of normal blood, which he terms the "complement." The complement is incapable, however, of combining directly with foreign cells to be destroyed; an intermediate body is necessary. The intermediate body is a thermostable substance which is found in immune blood and is called the "immune body," or more commonly the "amboceptor," as it has two atom groups, one of which unites with the complement, while the other unites with the cells to be destroyed. Complements and amboceptors are believed to exist in immune blood in great variety and of many chemical affinities, enabling them to exercise specific and exact selective powers.

The origin of amboceptors is believed by Erlich to be the same as that of antitoxin; but Metschnikoff, who has modified his views of phagocytosis so that they are more in harmony with Erlich's views, insists upon the phagocytic cells as the originators of substances concerned in cytolysis, an in recognition of its ferment character, he has given the name "cytase" to the complement, and that of sensibilizing substance (*substance sensibilisatrice*) to the immune body—amboceptor.

The natural resistance of the animal body to any given type of infection, which condition is not necessarily associated with that of robustness or vigor of constitution, may be lessened or temporarily destroyed by various means; for illustration, the natural resistance of chickens to anthrax may be overcome by reducing the bodily temperature of the chickens (Pasteur). The natural resistance of rats to anthrax may be destroyed by forcing them to turn a revolving wheel until they become exhausted (Roger). The immunity of white rabbits to anthrax may be overcome by feeding or by injecting into them phloridzin, so as to induce glycosuria (Leo). Now, assuming that natural resistance to infection is due to an absence or poverty of side chains, it is difficult to conceive how such absence or poverty can be overcome by the conditions mentioned.

The difficulties which confront the side chain theory will be increased in magnitude and number when we seek an explanation of variability in duration of acquired immunity. To assume that immunity acquired from a given species of bacterium is due to the combined presence in the organism of specific amboceptors, requires us to believe (a) that these bodies are continually present during the period of immunity—probably during the term of life of the person, (b) that there exists in the blood specific amboceptors representing each and every disease from which the person has acquired immunity, and finally, as a condition of permanent immunity can only be maintained by a permanent supply of fresh amboceptors to replace those worn out, the side chain theory requires us to believe that these bodies possess the power of reproduction.

THE FERMENTATION THEORY OF IMMUNITY.

The forces involved in this theory of immunity are those operating in nature within and without the living organism. They are the forces which constitute motion in matter, and are the same when manifested in the operations of the telephone, the phonograph, or in wireless telegraphy, that they are in bringing about

atomic rearrangement in albumin molecules in the production of immunity. The centers of activity of the forces in the production of acquired immunity are the albumin molecules of the plasma and tissue cells of the living organism. It is known of these bodies that they are massive in size, complex in structure, unstable in composition, are plastic in adaptative processes, and that the distance from the normal albumin to poisonous toxalbumin is not far. Further, it is believed that albumin molecules of the body juices and cells exist in homologous groups of great variety—isomers of albumin. That similarity in atomic arrangement and in molecular energy between the molecules of the plasma and the cells of the body, affords the latter selective activities in nutritional processes, and in the same way, a similarity in molecular structure and energy of a toxin, or of foreign cells and plasma albumin molecules, it is believed, will give the former selective power in producing infection and immunity.

It is seen, therefore, that the fermentation theory in many respects runs parallel to the side chain theory of immunity; especially so when we consider the tendency of modern science to refer chemical action in its ultimate analysis to physical motion. But as the fermentation theory was published long before the other, it can not be called a modification of it.

The source of energy manifested by a pathogenic micro-organism has already been described, and it has also been shown how such energy brings about a dissociation of susceptible albumin molecules of the living body, and why the dissociated atoms recombine into antitoxins, and thus cause the development of antitoxic immunity of the organism. As this form of immunity is due to neutralization of the toxin by the antitoxin, and as it has neither bacteriolytic power, nor the ability to prevent the conversion of albumins into toxalbumins by the micro-organisms of the disease, it is necessarily short lived. The protection of the organism which is furnished by antitoxic immunity continues only during the time that antitoxins remain in the body, and as these are eliminated by the various organs of excretion, and as they possess no means

of perpetuating themselves, theory confirms observation that duration of protection afforded is fugacious.

It is a matter of common observation, however, that immunity which follows an attack of disease in many forms of infection, and also that which follows inoculation with the toxin, or with attenuated forms of the microbe, may be of long duration, possibly during the life of the person. This form of immunity is generally believed to be due to an acquired capacity of the immune body to destroy invading bacteria, and is, therefore, called "bacteriolytic immunity." Those who hold to this theory are called upon to explain a certain phenomenon which seriously militates this view, and which, so far as I know, remains unanswered. It is this: the bacillus typhosus may remain as a harmless parasite in the gall bladder and in post typhoid bone abscess, in immune persons, for years; the bacillus subtilis may remain unattacked in the infected spleen for an indefinite period of time. Query: Why does not the bacteriolytic serum destroy the microbes, and why is the patient not reinfected by the bacillus typhosus?

The difficulties do not confront the fermentation theory, which holds that two factors are necessary to infection of the living organism, viz.: (a) the presence of susceptible albuminoids, and (b) the presence of the pathogenic micro-organism. The absence of either factor will prevent infection.

Now, I call the second form of immunity, that which usually but not necessarily gives long protection to the organism, *somatic immunity,* in contradistinction to the first variety, antitoxic immunity. The operating factors in the two varieties are the same, but the effects produced are different. There is a complete dissociation and a rearrangement of susceptible albumin molecules into antitoxin—a foreign and non-nutritive substance—in antitoxic immunity; while in somatic immunity, the susceptible molecules are not dissociated and do not lose their nutritive value, but the atomic arrangement of the molecules is changed by the energy of the toxin and, in consequence of this, such molecules lose the susceptibility to the micro-organism that previously existed. It

follows, therefore, that the micro-organism previously pathogenic to the person is no longer so, and it may remain indefinitely without harm in the tissues of his body.

In speaking of the susceptibility of albumin molecules to the energy of the toxin of a given micro-organism, we must not lose sight of the relation in molecular structure, pointed out by Emil Fischer, between a ferment and the substance it can decompose, and which must exist before the one can affect the other. This relationship must also obtain between the molecular structure of the micro-organism and homologous groups of albumin molecules before the micro-organism can convert the molecules into toxin. Now, the toxin is necessarily an antibody to the micro-organism just as alcohol is an antibody to the yeast cells; it is also an antibody to other substances whose wave energy coincides with that of the micro-organism; the group of susceptible albuminoids come in this category, and the toxin is, therefore, an antibody to this group just as alcohol is an antibody to grape sugar. This explanation will enable us to better understand the rationale of action between the toxin, the micro-organism which produced it, and the susceptible group of albumins, whose molecular structure may be rearranged by the toxin and thus thrown out of harmony with and consequently immune to the micro-organism. It will be noted that the toxin is an antibody both to the group of susceptible albuminoids and the micro-organism, and as the two last named must coincide in wave energy that one may dissociate the other, it follows that the wave energy of the toxin must oppose both alike. We are now confronted by two facts; the first is, that the wave energy by which the toxin attacks the albuminoid group is not a direct energy, such, for example, as is that which results in the production of antitoxin, but is a reverse energy, that is, an opposing energy; our second fact is, that the toxin is an enzyme, and is more stable in atomic bonds than the albuminoids. Now, when reverse wave currents meet, one will destroy the other, if their energies are equal; when they are not equal, the stronger will first neutralize the wave energy of the weaker and then, with the remaining

energy, will cause an atomic rearrangement in the molecular structure of the weaker substance—the susceptible groups of albumin molecules. We can readily understand why this energy may not be sufficient to dissociate and yet be ample to produce a molecular rearrangement in the weaker body. Now, a molecular rearrangement of a substance, say of an homologous group of albumin molecules, may destroy the susceptibility to a given species of bacterium without destroying the nutritive value of the molecules. Molecules thus changed will have been thrown out of harmony, in synchronous molecular vibration, with the species of bacterium to which they had previously been susceptible and can not therefore be transformed into toxins by this species. Somatic immunity, I hold, is a condition of atomic rearrangement of susceptible molecular groups of the organism, so that their susceptibility to a given species of bacterium is more or less permanently destroyed. Since the albumin molecules are susceptible to the micro-organisms because of certain structural similarities held in common by the two, susceptibility will be destroyed and this group of molecules will become immune to the micro-organism when the structural similarities held in common cease to exist. It is understood, of course, that immunity of the albumin molecules carries with it immunity of the organism, and that permanency in duration of one coexists with permanency in the other.

The more permanent duration of protection which usually characterizes the somatic type of immunity, and that which distinguishes this type from that produced by antitoxins, is due to the fact that the atomic rearrangement of albuminoid groups, brought about by reverse wave energy of the toxin, show a marked disposition to permanency.

The contention that atomic rearrangement may be permanent in character is not unsupported by evidence; it is well known that changes in molecular cell structure may be produced artificially and that such changes may be transmitted from parent to progeny through many generations of the cells. I refer to the changes produced in cells by "attenuation." It has been shown that the

capacity of a ferment or pathogenic cell to bring about decomposition changes in susceptible substances, and to produce specific products may be increased or decreased, destroyed or restored, at the will of the operator by exposing such cells to attenuating influences or agents. It has further been made known that the capacity of a cell to produce ferment or infectious products is not a vital capacity, inasmuch as it can be destroyed without doing injury to the cell in its capacity to grow, to assimilate or to propagate itself. Since the capacity of a cell to excite fermentation or pathogenic changes is not a vital capacity, and since this capacity may be variously modified or destroyed by physical agencies, I have argued that the forces concerned are physical, and have pointed out their nature and origin. Now, since the condition of "attenuation" of bacteria and ferment cells is due to atomic rearrangement of cell structure, which may be permanent, and may be transmitted from parent to progeny, and since the changes produced in the plasma and tissue cells of the body by toxins are also atomic rearrangements, the same degree of variation in permanency of acquired structure will apply alike in both cases.

Before concluding this essay, it is but fair that I point out as I see them what may be regarded as weak places in the ferementation theory. The existence of atoms has never been absolutely proved, the atomic theory being accepted as true because it serves to explain and make intelligible chemical phenomena which otherwise would be obscure and inexplicable.

The evidence that atoms (molecules) possess a motion of translation, and that this is the source of radiant heat is almost positive; but the proof that they also possess an interior motion is less conclusive. Many scientists believe, however, that atoms not only have interior motions, but that such motions are primordial and ultimate, and are therefore indestructible. "That the molecule (atom) does not get its interior motion from the heat of dissociation is certain, for on being allowed to recombine, it yields up its transitory activity and with it as many degrees of temperature as disappeared in accomplishing its dissociation. We must not

endow the molecule (atom) wth gratuitous attributes, but it is surely an entity of some kind, having, in the first place, persistent and regulated motion; secondly, it has inertia, or mass, the property of conserving *"vis-viva."* Thirdly, it has some bond with its fellow, by which the motions of both are modified by constant stress, according to a definite law of distance; and this, following Newton, we call *attraction.* Fourthly, it has the complex property of interchange of momentum, accompanied by that of conserving and compounding motion by angular rebound upon an infinitely near approach, which we call 'resiliency' or 'repulsion.' It is conceived as having dimensions, figure, polarity, elasticity and harmonic vibration with periods as undeviating as those of the 'Moons of Mars.'"

The fermentation theory is based upon the hypothesis, in the absence of positive supporting proof, that the interior motion of atoms are transmitted to the surrounding ether as wave motions of energy just as the translatory waves of atoms are transmitted in the development of ether waves of radiant energy, heat and light. Proof that the interior specific motions of atoms transmit to the ether related vibrations (waves) must rest for the present, as the atomic theory does, upon the competency of this theory to intelligently explain large groups of physical phenomena which otherwise are obscure and inexplicable.

Professor Julius Thompson (*Thermo-Chemical Investigation*) says: "Theoretical chemistry is based upon the molecular theory, according to which all matter is made up of molecules and these molecules of atoms. The physical state of bodies depends upon the arrangement and motions of the molecules; the other physical and chemical properties depend upon the kind and number of atoms in the molecule, upon their arrangement and relative motions."

Now, this statement as it stands does not convey to the mind how "the number and kinds of atoms in the molecule, their arrangement and relative motions," gives to matter the chemical and physical properties it possesses. The statement is simply one

of fact and is not an explanation of the nature of the forces which bring about the chemical and physical changes referred to. The chemical and physical properties of matter, and the rationale of their action, will become intelligible, however, when it is understood that the latent or potential energy of matter is the sum of energy of its molecular ether waves which become active or kinetic energy, capable of molecular dissociations and reassociations when, under favorable conditions, it is brought in contact with molecular structure whose wave energy bears a definite, required relation to the molecular wave energy of the first.

Michael Foster, in discussing physiological problems, has this to say: "We have, in speaking of protoplasm, used the words 'construction,' 'decomposition' and the like, as if protoplasm were a chemical substance. And it is a chemical substance, in the sense that it arises out of the union or coincidence of factors which can be resolved into what the chemists call 'elements,' and it can be, at any time, by applying the appropriate means, broken up, into the same factors and, indeed, into chemical elements.

"This is not the place to enter into a discussion of the nature of the so-called chemical substances, or, what is the same thing, a discussion concerning the nature of matter; but we may venture to assert that the more these molecular problems of physiology, with which we are now dealing, are studied, the stronger becomes the conviction that the consideration of what we call 'structure' and 'decomposition' must, in harmony with the modern teachings of physics, be approached under the dominant conception of modes and motion.

"The physicists have been led to consider the qualities of things as expressions of internal movements; even more imperative does it seem to us that the biologist should regard the qualities (including structure and composition) of protoplasm as in like manner the expression of internal movements.

"We must not pursue the subject any further here, but we feel it necessary to introduce the caution concerning the word 'substance.' We may repeat the assertion that it seems to us neces-

sary for the satisfactory study of the problems on which we have been dwelling, to keep clearly before the mind the conception that the phenomena in question are the result, not of properties of the kinds of matter, in the vulgar sense of the word, but of kinds of motion."

The "kinds of motion" in matter capable of producing "the phenomena in question" are not described by the distinguished physiologist and author whom I have quoted. The motions of atoms and molecules do not, of themselves, satisfy the understanding as such motions alone are incapable of accounting for the energy manifested specifically by matter in its various forms. Something else is needed to make the forces of "construction," "decomposition" and the like intelligible, and this something, I claim, is supplied by the theory that vibrating atoms produce in the ether corresponding vibrations.

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A NEW FORMALDEHYDE GENERATOR.

S. M. MORRIS, M. D..

GALVESTON, TEXAS.

Some months ago when my attention was first attracted to the subject of disinfection by formaldehyde, I was struck while searching the literature of the subject with the practical unanimity of opinion among experimenters that formaldehyde was to be considered only a surface disinfectant and that it possessed very little power of penetration.

Since the density of formaldehyde gas is almost exactly that of air, being in the ration of 15 to 14.42, and since the rates of diffusion of gases are functions of their densities, theoretically there should be no reason why formaldehyde gas should not have the same power of penetration as air and be capable of going where air can go in the same period of time.

Before continuing the discussion of this phase of the subject I wish to mention very briefly the various methods of disinfection by formaldehyde which are in use at the present time, or rather the more important methods only. The most widely used method, perhaps, consists in heating the aqueous 40 per cent solution of the gas in water (formalin) either pure or containing glycerine or calcium chloride, and heating under pressure preferably, or more commonly in an open retort and carrying the vapors into the space to be disinfected by means of a tube thrust through a keyhole or other opening, the doors and windows having been previously closed and crevices stopped with cotton or by pasting strips of heavy manila paper over them. When the liquid is heated, which contains not only gaseous formaldehyde in solution, but also its polymerides, such as paraformaldehyde and trioxymethylene in an open retort, water is principally driven off at first in the form of steam and it is not until one-half or two-thirds of the liquid has been evaporated that the gas is evolved to any consider-

able extent. It is recommended to use in this method from ten to sixteen ounces of formalin to each 1,000 cubic feet.

It has occurred to me that since this is the usual method of generating the gas that perhaps the method itself was responsible for the opinion that the gas had but little penetrating power. Since steam is driven off first, of course it condenses immediately upon the cool surfaces of the walls, fabrics, furniture, etc., in the apartment and when the gaseous formaldehyde follows later it simply redissolves in this film of moisture and goes no further than the water has gone, thus being superficial in action. In support of this view is the well known fact that the higher the temperature of the atmosphere the greater is the disinfecting or germicidal action of the gas, the increase in temperature decreasing the amount of condensation of the water vapor. This being the case the thought suggested itself to me to introduce the gas first with the minimum amount of water, allowing it to thoroughly diffuse and penetrate and then to introduce water vapor in considerable amount, later in amount sufficient to saturate if possible or to nearly saturate the atmosphere and thus fix as it were the gas in the tissues of the micro-organisms which have been reached by it. These advantage are possessed by my generator, to be afterwards described.

The second method of using formaldehyde consists in heating by means of a simple lamp, paraformaldehyde, which is a solid polymer of formaldehyde, which is by the heat converted into the gaseous form. By this method no water whatever is introduced into the atmosphere, other than that which it may happen to contain at the time, and therefore a larger amount of the agent is required than would be the case if moisture were added. By calculation I find that it requires about 758 grams of paraformaldehyde, or nearly 1.7 pounds, to each 1,000 cubic feet to produce two per cent by volume.

The third method is the one I prefer, because of its many advantages and consists essentially in oxidizing the vapors of wood alcohol by passing them mixed with air over some oxidizing material.

Various lamps operating upon this principle have from time to time been constructed, but have not been generally used, the reason being, in my opinion, because of the slowness with which they evolve the gas, for unless the gas is generated in large volume at once it leaks out of an ordinary apartment about as rapidly as it is generated. A small volume of formaldehyde acting for a long period of time is not nearly so efficacious as a large volume acting for a comparatively short period of time.

So far as I can learn all of these lamps have used as the oxidizing material asbestos cardboard impregnated with finely divided platinum. A lamp operating upon this principle can be easily constructed by any one by using an empty tin can or other suitable small vessel, cutting out a piece of asbestos cardboard to fit the top of the can, punching a number of small holes in the cardboard, soaking the cardboard in a solution of platinum chloride and then igniting it. This decomposes the platinum chloride, driving off the chlorine and leaving the platinum in a finely divided state on the cardboard. Next fill the vessel nearly full of wood alcohol, ignite the alcohol and hold the cardboard a few inches above the flame and after a minute or so lower the cardboard and be sure that the flame is extinguished. Immediately formaldehyde begins to be evolved, due to the vapor of the heated alcohol passing over the heated platinized asbestos and there undergoing oxidation into formaldehyde at the expense of the oxygen of the air. The chemical action keeps the platinum hot and the process will continue until the level of the alcohol in the vessel gets so low as to lessen the rate of evaporation to such an extent as to allow the platinum to cool, when the operation ceases. Very often the heat of oxidation is so great as to ignite the alcohol and it was invariably my experience while experimenting with this type of apparatus that every attempt to construct a device on a large enough scale to generate formaldehyde enough to be of practical service was attended with spontaneous ignition of the alcohol. Various other oxidizing materials were tried with the result that I found that asbestos wool impregnated with certain copper salts and then

ignited produced under proper conditions a very energetic evolution of formaldehyde gas and by enclosing such material between sheets of wire gauze I was enabled to bring it within an inch of the surface of the alcohol while in operation, without danger of igniting the alcohol, thus enabling me to use the heat of oxidation to the greatest advantage in increasing the rate of evaporation of the alcohol and therefore increase the rate of production of the formaldehyde. This latter point is of vital importance because one quart of alcohol oxidized within an hour in a space of 1,000 cubic feet is of greater value than a gallon oxidized within a period of several hours unless the room is absolutely tight so that none of the gas can escape, conditions, however, which are never even approximated in actual practice.

My device may be essentially described as follows: A bowl or basin packed with asbestos or other noncombustible absorbent material, into which wood alcohol is poured. Near the rim of the basin is a number of small holes, which can be closed by a movable band and which are intended to introduce air for the oxidation of the wood alcohol. Above the bowl is the oxidizing disk, consisting of the oxidizing material enclosed between sheets of wire gauze. Above this is a pan designed to contain water and above it a vessel to be afterwards described. To operate the generator the disk is raised by the small chains on the side for that purpose, anchored in the elevated position by attaching the ends of the chains to the small knobs, a mixture of wood alcohol and carbolic acid to the amount of 1,000 c. c. to the 1,000 cubic feet to be disinfected is poured into the basin by means of a flat shaped funnel, the holes in the rim closed, and the alcohol ignited. It is allowed to burn for a couple of minutes in order to get the disk hot, when the disk is lowered. Its edges dipping into a trough around the sides of the basin extinguish the flame. The holes are again opened and the pan having been previously filled with water, the operator leaves the room, which he usually is compelled to do immediately, owing to the energetic evolution of the gas. The room having been previously properly closed the door is closed and the device is left to itself for a period of from three to six hours.

The oxidation of the alcohol vapor keeps the disk hot, and this being so near the surface of the alcohol, heats it to such an extent as to completely vaporize one gallon of alcohol in from one and a half to two hours, smaller quantities in proportionately less time. The gas is in a highly heated condition and as it rises it impinges against the under surface of the water pan and begins to heat the water. However, a large volume of gas is thrown off before the water vapor begins to be evolved. As shown in the reaction, $CH_4O+O=CH_2O+H_2O$, there is liberated in the production of 30 parts of formaldehyde, 18 parts of water, or for 40 parts of formaldehyde 24 parts of water; while when the gas is liberated by heating the aqueous solution, for every 40 parts of gas there are liberated 60 parts of water, most of the water being introduced into the apartment before the formaldehyde, as previously described. The heat produced by the oxidation of the alcohol also perceptibly warms the atmosphere of a room and thus decreases the amount of condensation of the water vapor which occurs. I am quite positive also that by this method there is less polymerization of the formaldehyde gas and therefore the odor after disinfection is much less persistent.

The use of the vessel in the upper portion of the apparatus is for the purpose of burning sulphur when desired. While formaldehyde is by far the most efficient of the two gases for the destruction of micro-organisms, sulphur dioxide is more efficient in the destruction of insect life, mosquitoes, etc. Therefore, when it is desired to combat insect borne diseases—malaria, yellow fever, etc., the fumes of burning sulphur can be produced. Both formaldehyde and SO_2 can be generated simultaneously with great advantage in many cases without any interference chemically with each other. What virtue the addition of the carbolic acid to the alcohol may have I am not yet certain; but actual experiment has shown that carbolic acid is volatilized and I am inclined to the belief that it increases the germicidal value of the formaldehyde. Further experiments will be made to determine this point. During the bacteriological experiments made by Dr. Smith and Dr. Ter-

rill, the report of which is here appended, it was thought that it might be of value to make a determination of the volume of gas in the apartment at the end of stated intervals. Accordingly, however, in series 4 the generator was charged with 1,500 c. c. of alcohol and phenol mixture and definite quantities of the air aspirated at the end of one and two and three hours after the machine was put in operation, through a standard solution of ammonia and the amount of ammonia not neutralized determined by titration with standard acid, and from the data obtained the amount of gas by volume calculated. This method is in general use, although there are a number of possible errors incident to it, but I will give the results for what they are worth. The values so obtained are often quite discordant. If the results are to be relied upon then this method of generating formaldehyde is a very efficient one for the reason that most authorities state that two per cent by volume is necessary to effectually destroy pathogenic organisms after several hours exposure. At the end of one hour by the method mentioned I found the atmosphere to contain 1.6 per cent by volume of formaldehyde, at the end of two hours 0.95 per cent, and at the end of three hours 0.75. Now, since in series No. 3, where sterilization was effected with 750 c. c. of alcohol in from three to six hours, the percentage must have been less than half of the amounts present in series 4, and yet the results were all to be desired. From the experiments made by Dr. Smith and Dr. Terrill and from others made by myself in a room of about 2,500 cubic feet capacity I have found that from 750 c. c. to 1,000 c. c. can be relied upon to disinfect a space of 1,000 cubic feet, in from three to six hours. That the atmosphere of the room was saturated in series 4 was shown by the fact that moisture condensed copiously upon the window glass.

The advantages of the device may then be summarized as follows: The short time required for sterilization owing to the rapid evolution of the gas, cheapness of operation, simplicity, requiring only a few minutes of one's time to set it in operation and then requiring no further attention, and finally the convenience.

The results of the bacteriological tests are appended.

THE OCCURRENCE OF TAENIA NANA IN TEXAS (THE FIRST OR AT LEAST THE SECOND REPORTED CASE IN NORTH AMERICA).

JOHN T. MOORE, M. D.

Associate in Clinical Medicine, University of Texas, Medical Department, and Surgeon G., H. & H. Ry., Galveston.

I take this opportunity of presenting to this Association a case that is of quite rare occurrence in this country.

On August 2, 1902, a section foreman who works for the Galveston, Houston and Henderson Railway consulted me for a severe diarrhea, great weakness and cramps in the abdomen.

He was given a diarrhea mixture and asked to return in case he was not relieved. He came back on August 4th, stating that he was no better.

I suspected from the history that he was suffering from amœbic dysentery or some intestinal worm, and asked him to go to the infirmary where he could receive the proper care and have the stools examined.

I gave instructions to save all the stools passed and to examine carefully for all intestinal parasites and their ova.

Dr. J. R. Elliott, interne at St. Mary's Infirmary, to whom is due the credit of first finding the ova, reported that he had found the ova of some tapeworm that he thought fit the description of tænia nana.

We went over the examination very carefully together and soon became convinced that we had the ova of tænia nana.

I ordered an anthelmintic given, and instructed them to save everything passed. Much time was spent in washing the stool through a muslin cloth, but without finding anything. I now adopted the plan of putting small quantities of the fecal material

in a clear glass beaker filled with water. We were soon rewarded by finding pieces of the worm. We washed quite a good deal of the material, hoping to find the whole worm, or at least the head, but were unsuccessful.

I submitted specimens to Dr. C. W. Stiles, Chief of the Division of Zoology, Washington, and to Dr. A. J. Smith, Professor of Pathology, University of Texas, for identification. They very promptly verified our diagnosis of hymenolepis (tænia nana), as shown by their notes, which I here publish:

WASHINGTON, D. C., August 28, 1902.

Referring again to your letter of August 9th, I would state that the specimens have been stained and mounted. Unfortunately, the material is in a poor state of preservation, so that it was impossible to make any very minute observations upon it. Nevertheless, sufficient was seen to lead me to believe that you are safe in classifying the tapeworm as tænia nana, or, according to the more modern classification of tapeworm, as hymenolepis nana (Siebold, 1852).

GALVESTON, TEXAS, September 10, 1902.

The specimen of tapeworm links sent me today, with request to confirm or correct your identification as tænia nana, has been examined.

I am confident of the correctness of your diagnosis.

The specimen is extremely rare, and its occurrence here should be reported for record.

Very sincerely,
ALLEN J. SMITH.

CASE: T. O. C. Occupation, section foreman in G., H. & H. Ry. yards; residence, Galveston; single; age 35 years; born in Ireland.

Family History: Father died at age of 68; mother died at about the same age. Previous health of both parents good. Four brothers and four sisters living and in good health.

Personal History: Drinks beer and gets drunk now and then. Smokes tobacco.

Previous Residence: Came from Ireland to Sedalia, Mo., in 1879, passing through Boston. He lived at Sedalia eighteen months, working on the railroad tracks in the yards there. From Sedalia he came to Texas, stopping first at Laredo, thence to Waco,

Dallas, Longview, Palestine, and San Antonio. He worked at Cleburne, Texas, four or five months during 1882, and at Houston most of 1883. From 1883 to 1891 he was working at Galveston or in that vicinity. In 1892 he worked on the Galveston jetties. He worked on the Santa Fe Railway near Arcola, Texas, during 1893. In 1894 he was working on the Alta Loma pipe line, the line furnishing Galveston her water supply from artesian wells eighteen miles away. Worked on city railroad during 1895; after this he went to Houston for three years, thence back to Galveston in 1900, where he has since lived. During all of this time he says that his health was perfect.

Previous Diseases: None.

Present Disease: Two months before entering hospital, which was on August 4, 1902, he felt feverish, especially during the mornings, and had considerable headache at times. He would be well for two or three days and then get sick again. Appetite was good, and bowels regular during this time.

One week before consulting me (July 28, 1902), he was taken with a severe diarrhea. The bowels would move eight or ten times during the day and as often during the night. There was considerable pain in the belly about the umbilicus. He passed much blood and mucus; appetite poor. He complains now (August 3rd) of pain in belly, diarrhea, and great weakness.

Present Condition: He is a tall man, height six feet, weight about 150 pounds, rather sparely built; temperature 101° F.; pulse 110; respiration 18. Heart and lungs normal. Liver and spleen a little enlarged. Some tenderness over stomach and abdomen.

Some intestinal parasite was suspected, and he was advised to enter the hospital, which he did August 5, 1902. The blood examination for malarial parasites was negative.

August 5th. The patient passed a very restless night. The bowels moved about twenty times during the past twenty-four hours.

The stools were examined by Dr. J. R. Elliott, who reported finding the ova of some intestinal worm, probably tænia nana.

I ordered the following given:

℞ Olei resin aspidii.....1 drachm.
Ext. kamalæ fld.....1 drachm.
Ext. of krameriæ fld.....½ drachm.

To be taken at 9 a. m., and followed by one ounce of castor oil.

August 8th. Temperature normal and patient feeling well. He insists upon going out.

March 22, 1903. I saw the patient today and he says that his health is fine. He has not been sick since leaving the hospital.

HISTORICAL.

The parasite was discovered by Bilharz in 1851 in the intestine of a young man who died of meningitis. The worm was found in great numbers. A description was given by Von Siebold and Bilharz a little later. Leuckhart afterward gave a complete description from specimens given him by Bilharz. Four specimens of this tænia are found in the collection of worms in the College of the Faculty of Medicine in Paris. They had been given to Dr. Davaine by Burguieres.

Hellich, in 1885, obtained some of these worms in a child seven years old. This was the daughter of a barber. She was given male fern and passed a tænia solium, a few oxyuris vermiculares, and about fifty tænia nana.

Other doses of this drug were given and in five successive times she passed 250 of the worms. Leuckhart received some of these specimens and identified them as tænia nana. There are specimens to be found in the museum of Orfila said to have been given by Professor Dokitch in September, 1885, secured while traveling in Servia.

In 1873, Spooner found a small worm in the United States, which he thought to be tænia nana. The specimens were given to the College of Physicians of Philadelphia. Leuckhart is disposed to think the specimen was tænia flavopunctata. If this was tænia nana then it was the first case occurring in North America.

Grassi, in 1887, called attention to the fact that tænia nana was

a very common parasite in Sicily. He said it had several times been found in Lombardy.

It was observed in a young Nubian in Cairo in 1885 by W. Innes. Ransom reports finding a case in England in 1888.

Geographical Distribution.—This tænia has been found in many parts of the world. Bilharz discovered the parasite in Cairo. Dr. Haley found the worm in a seven year old child in Belgrade.

Specimens were obtained from Servia in 1885. Spooner thinks he found the tænia in the United States at Philadelphia. Grassi says this is a very common parasite in Sicily. He secured specimens of the worm from the two Sicilians. Ransom observed tænia nana in England. It is known to exist in Lombardy (Grassi, Comini, etc.). Piedmont (Peroncito), Tuscany (Sonsino), and Sicily (Grassi and Calandruccio). Grassi found it in Marseilles. Zograph found it in Russia; Mertens in Germany. Lutz found it in two little girls in Brazil. Wernicke and Blanchard found the worm in the Argentine Republic.

My case evidently contracted the parasite here in the vicinity of Galveston. There were two men working on the section with this man who had diarrhea of the same character, but I was unable to secure feces for examination. I feel convinced, since finding tænia nana in this man, that the other two were also infected.

Dr. Stiles writes me that he has recently found four cases in Georgia, and one of his assistants has found another case in an asylum in Washington.

The parasite is evidently much more widely distributed than we have heretofore thought.

GENERIC AND SPECIFIC DIAGNOSIS.

Genus Hymenolepis Weinland, 1858.

Generic Diagnosis.—Dipylidiinæ: Body small, filiform; head small, rostellum retractile, well developed and armed with a crown of twenty-four to thirty small hooklets; or rudimentary and unarmed; suckers usually unarmed; neck long; lateral border of strobila has serrate appearance much like the toothed edge of a saw

blade. Genital pore single, unilateral, on left margin. Testicles usually three to each segment, two on right, one on left side. Gravid segments transformed into a sac full of clear, round or oblong eggs, which are surrounded by three shells; internal shell occasionally with a small knoblike structure at each pole.

Larva a cryptocyst, or a staphylocyst.

Type Species.—Tænia flavopunctata (Hymenolepis diminuta).

Synonyms.—Hymenolepis Weinland, 1858; *Diplacanthus* Weinland, 1858 (not Agassiz, 18, fish); *Lepidotrias* Weinland, 1858; *Diplocanthus* Cohn, 1899 (misprint).

For list of species and bibliography see Blanchard, 1891, *Hist. Zool. et Med. des T'eniad'es du genre Hymenolepis.* Paris, 112 pp., 22 figs.

THE DWARF TAPEWORM.

Hymenolepis nana (Siebold, 1852) Blanchard, 1891.

Specific Diagnosis.—Hymenolepis: Strobila attains 10 to 40 mm. in length and 0.5 to 0.9 mm. in breadth; composed of about 150 to 200 segments. Head subspherical, 0.25 to 0.33 mm. in diameter; rostellum thick retractile, 100 long, 80 to 90 broad; hooks 20 to 30 in number, 14 to 18 long, and arranged in a single row; suckers lobular, 90 to 105 (according to some authors to 200) in diameter. Unsegmented neck quite long, not distinctly defined from head and about half as broad. Anterior proglottids very short, scarcely distinct; the following become gradually longer and broader, always remaining broader than long, attaining 0.14 to 0.30 mm. in length by 0.41 to 0.92 mm. in breadth. Vitellogene gland globular. Only about 100 eggs found in gravid segments; eggs globular to oval; outer envelope 30 to 60; inner envelope 16 to 28, presenting at each pole a more or less conspicuous mammillate projection provided with filamentous appendages; onchosphere 16 to 22 by 18 to 20 in diameter; hooks of onchosphere 10 to 14 long.

Synonyms.—Tænia nana von Siebold, 1852 (not P. J. van Benden, 1861); *Tænia Ægyptiaca* Bilharz, 1852; *Diplacanthus nanus*

Weinland, 1858; *Tænia* (*Hymenolepis*) *nana* Leuckart, 1863; *Tænia murina* Dujardin (not Gmelin, 1789).

Description of Specimens.—Fig. 3 shows four segments in which it is seen that the genital opening is on the same side as the segments. These segments are almost far enough toward the tail end to contain mature ova, as one is seen at a.

Owing to the specimens being in a poor state of preservation no minute observations could be made, but one can make out the remnants of the male genital, which are seen in drawing. The immature ova have filled the uterus and make it conform to the shape of the segments.

The Ova.—The mature segments, which contain from 20 to 30 ova, were carefully studied.

When the ova are first encountered Fig. 4 gives a good idea of their appearance.

The hooklets of the embryos being seen without any difficulty at all. The interval between the outer and inner shells is seen upon very close observation to be made up of a substance which is quite clear, but running through it and apparently coming from what may be termed the poles, are a number of filaments. These are made out with great difficulty. Fig. 5 shows this quite well.

Lying within the inner shell is the embryo, which has six hooklets in most cases, but quite a number of ova were seen having only five, due probably to their being obscured by the others.

The average for a number of measurements was outer shell 40 *u* by 31.9 *u*, the inner shell 29.2 *u* by 26.6 *u*.

The hooklets which are shown in the ova measured from 10-13 *u* in length. Fig. 7 shows a hooklet enlarged.

Pathological Significance.—It is not known definitely how the infection is gotten, but from the great number found in the intestines it has been suggested that the ova are taken into the stomach with water or vegetables. It is not my aim to discuss this phase of the subject here, but it is quite desirable that some one discover the means of infection. This parasite has been found in large numbers in the small intestine and they have been known to pass

through the ileo-cœcal valve. Thousands of these worms may inhabit a single intestine.

The symptoms may be divided into two main groups: (1) Intestinal; (2) nervous.

From the irritation of the mucous membrane of the intestine there is apt to be loss of appetite, diarrhea, alternating with constipation, colicky pains in the abdomen and stomach, and great nausea.

The nervous symptoms are headache, disturbance of vision, dizziness, melancholia and in many cases attack of epilepsy.

Where only a few parasites are present there may be no symptoms at all, but if the worms are numerous the symptoms are apt to be of a severe character. Anæmia follows later with its train of symptoms.

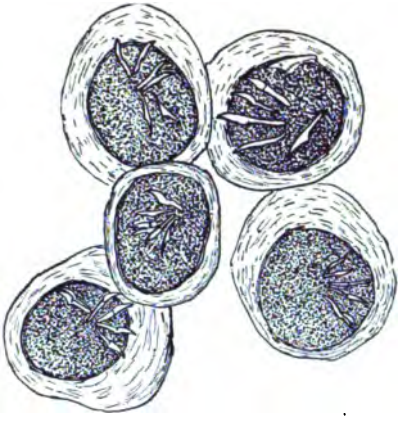
One is somewhat at a loss to account for such severe symptoms where so few worms are present, but as they rapidly disappear upon ridding the patient of the worms the parasite must be responsible for them.

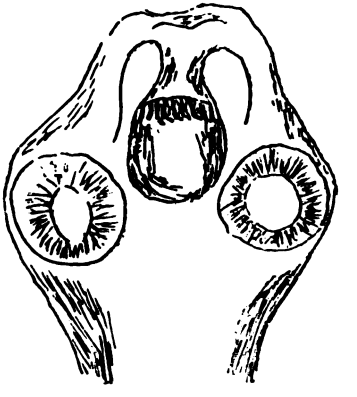
It must be the combined irritation to the intestine and the liberation of toxins. The predominant symptoms in my case were obstinate diarrhea, cramps in the abdomen and limbs, headache and great weakness. One dose of the anthelmintic completely relieved him.

Diagnosis.—The diagnosis is readily made by examination of the stools microscopically. The ova are easily recognized.

Treatment.—Male fern is the best drug to use for their expulsion. One drachm of the oleo-resin of male fern taken after a fast and followed by an active purge is usually all that is needed. Thymol and santonin are said to be of no value.

I am very much indebted to Dr. Charles W. Stiles, Chief of Division of Zoology, for the generic and specific diagnosis and for his aid in the study of the ova and the segments. And to Dr. A. J. Smith for his assistance in the preparation of drawings and his assistance in many ways. Also to Mr. B. N. Ransom for his excellent drawing of the egg.





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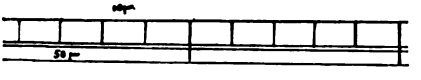

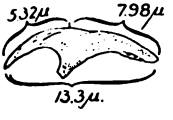

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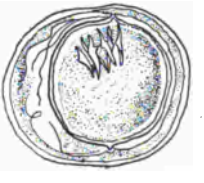

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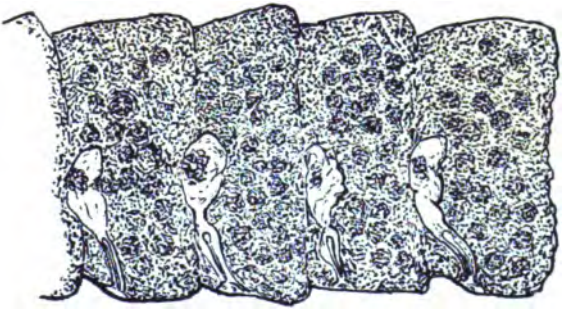

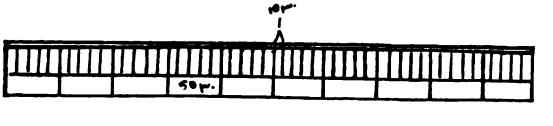

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Burleson, J. H.	San Antonio	Bexar.
Burrows, H. A.	New Boston	Bowie.
Bute, Jas. H.	Houston	Harris.
Calhoun, B. F.	Beaumont	Jefferson.
Campbell, P. L.	Dallas	Dallas.
Campbell, W. R.	Chappell Hill	Washington.
Cantrell, C. E.	Greenville	Hunt.
Carleton, J. C.	Bonham	Fannin.
Carter, J. T.	Walhalla	Fayette.
Carter, W. S.	Galveston	Galveston.
Cary, E. H.	Dallas	Dallas.
Chapman, Harry J.	San Antonio	Bexar.
Chapman, P.	Winchester	Fayette.
Chase, E. D.	Galveston	Galveston.
Chase, Ira C.	Fort Worth	Tarrant.
Chilton, P. H.	Comanche	Comanche.
Clark, I. E.	Schulenburg	Fayette.
Clarke, J. F.	Paris	Lamar.
Cline, I. M.	New Orleans	Louisiana.
Clough, E. L.	Beaumont	Jefferson.
Coble, J. M.	Dallas	Dallas.
Cochrum, J. V.	Island	Limestone.
Coleman, P. C.	Colorado	Colorado.
Collins, W. B.	Lovelady	Houston.
Collom, S. A.	Kennard	Houston.
Combs, H. B.	Bastrop	Bastrop.
Comer, C. C.	Carthage	Panola.

Name.	Postoffice.	County.
Conerly, T. W	San Angelo	Tom Green.
Cook, D. M	Jonah	Williamson.
Cooke, H. P	Galveston	Galveston.
Corley, Sam	Clarksville	Red River.
Cornick, Boyd	San Angelo	Tom Green.
Cross, Edward	San Antonio	Bexar.
Crossthwait, W. L	Holland	Bell.
Crouse, H. W	Victoria	Victoria.
Crump, J. G	St. Jo	Montague.
Crutcher, W. C	Mt. Vernon	Franklin.
Cummings, H. W	Hearne	Robertson.
Curtis, W. K	Midland	Midland.
Daniel, F. E	Austin	Travis.
Dean, J. J	Waco	McLennan.
Decherd, H. B	Galveston	Galveston.
Dodson, J. E	Vernon	Wilbarger.
Dorbandt, J. D	Lampasas	Lampasas.
Douglass, J. G	Itasca	Hill.
Duggan, Malone	Eagle Pass	Maverick.
Duncan, T. G	Victoria	Victoria.
Duringer, W. A	Fort Worth	Tarrant.
Dyer, E. G	Starr	Mills.
Eagon, S	Dallas	Dallas.
Eastland, J. H	Waco	McLennan.
Ehlinger, Otto	La Grange	Fayette.
Embry, John A	Decatur	Wise.
Erwin, J. C	McKinney	Collin.
Evans, J. H	Palestine	Anderson.
Evans, J. R	Devine	Medina.
Evans, W. T	Jewett	Leon.
Farmer, Thos. J	Dublin	Erath.
Feild, J. T	Fort Worth	Tarrant.
Ferguson, A. O	Emma	Crosby.
Finney, W. D	Wrightsboro	Gonzales.
Florence, J. H	Rockport	Aransas.
Fly, A. W	Galveston	Galveston.
Fly, D. R	Amarillo	Potter.
Ford, F. C	Nacogdoches	Nacogdoches.
Ford, J. F	Decatur	Wise.
Fowler, W. E	Huntsville	Walker.
Frazier, J. M	Belton	Bell.

Name.	Postoffice.	County.
Fry, J. M.	Wills Point	Van Zandt.
Gammon, Wm.	Galveston	Galveston.
Garrett, F. D.	Gainesville	Cooke.
Garwood, A.	New Braunfels	Comal.
Gee, J. N.	Bethel	Anderson.
Ghent, H. C.	Belton	Bell.
Gibson, B. F.	Midway	Madison.
Gidney, C. C.	Granger	Williamson.
Gilbert, A. J.	Hillsboro	Hill.
Gilbert Joe	Austin	Travis.
Gilcreest, J. E.	Gainesville	Cooke.
Gilson, F. J.	Calvert	Robertson.
Goddard, C. W.	Holland	Bell.
Goeth, Richard A.	San Antonio	Bexar.
Grace, M. B.	Seguin	Guadalupe.
Graves, Edwin	Gatesville	Coryell.
Graves, M. L.	San Antonio	Bexar.
Gray, A. J.	Comanche	Comanche.
Grigsby, C. M.	Kaufman	Kaufman.
Guenther, J. G.	Moulton	Lavaca.
Guinn, E. E.	Jacksonville	Cherokee.
Gunby, I. P.	Sherman	Grayson.
Hackler, G. M.	Ennis	Ellis.
Haden, H. C.	Galveston	Galveston.
Halley, J. T.	Galveston	Galveston.
Hamilton, Edward	Houston	Harris.
Hamilton, H. J.	Laredo	Webb.
Harben, R. P.	Richardson	Dallas.
Harlan, W. J.	Bartlett	Williamson.
Harper, W. A.	Austin	Travis.
Harris, W. T.	Mathis	San Patricio.
Hathcock, A. L.	Palestine	Anderson.
Heaney, A. G.	Corpus Christi	Nueces.
Heartsill, O. M.	Marshall	Harrison.
Herff, Adolph	San Antonio	Bexar.
Herff, F.	San Antonio	Bexar.
Herring, J. H.	Forney	Kaufman.
Hicks, F. M.	San Antonio	Bexar.
Hilgartner, H. L.	Austin	Travis.
Hill, H. B.	Austin	Travis.
Hix, R. W.	Vernon	Wilbarger.

Name.	Postoffice.	County.
Hodge, C. W.	Quanah	Hardeman.
Holloway, J. A.	Round Rock	Williamson.
Holt, Jno. B.	Lockhart	Caldwell.
Hons, J. M.	San Marcos	Comal.
Hooker, J. D.	Alice	Nueces.
Howell, R. M.	Killeen	Bell.
Hudson, S. E.	Austin	Travis.
Hudson, T.	Belton	Bell.
Hughes, C. T.	Gainesville	Cooke.
Hunter, J. W.	Waco	McLennan.
Hurt, Jno. H.	Big Springs	Howard.
Inge, J. M.	Denton	Denton.
Jackson, T. T.	San Antonio	Bexar.
Jameson, W. G.	Palestine	Anderson.
Jarrett, J. C.	Valley Mills	Bosque.
Jenkins, A. B.	Hubbard	Hill.
Jenkins, D. J.	Daingerfield	Morris.
Johnson, J. C.	Richmond	Fort Bend.
Johnston, E. A.	Amarillo	Potter.
Jones, J. C.	Gonzales	Gonzales.
Jones, W. C.	Walnut Springs	Bosque.
Jones, W. T.	Georgetown	Williamson.
Jones, W. T.	Marfa	Presidio.
Keiller, Wm.	Galveston	Galveston.
Kennedy, T. J.	Galveston	Galveston.
Kimble, E. W.	Gorman	Eastland.
Kimbrough, W. C.	Krum	Denton.
Kimbrough, W. G.	Krum	Denton.
King, C. E. R.	San Antonio	Bexar.
Kingsley, B. F.	San Antonio	Bexar.
Kirkpatrick, S. B.	Waco	McLennan.
Kittrell, T. E.	Texarkana	Bowie.
Knolle, Otto J.	Industry	Austin.
Knox, R. W.	Houston	Harris.
Kuhn, August	Walburg	Williamson.
Lancaster, W. H.	Lockhart	Caldwell.
Lankford, J. S.	San Antonio	Bexar.
Lankford, S. C.	Sherman	Grayson.
Layton, L. F.	Brownsville	Brown.
Leach, Hubert F.	Aledo	Parker.
Leake, H. K.	Dallas	Dallas.

Name.	Postoffice.	County.
Lee, E. A.	Aspermont	Stonewall.
Lee, Geo. H.	Galveston	Galveston.
LeGrand, C. W.	Hempstead	Waller.
Link, E. W.	Palestine	Anderson.
Link, H. R.	Palestine	Anderson.
Lister, S. W.	Richmond	Fort Bend.
Litten, Frank	Austin	Travis.
Littlefield, V. C.	Leesville	Gonzales.
Lloyd, Thos. P.	San Antonio	Bexar.
Logan, J. H.	Goldthwaite	Mills.
Loggins, J. C.	Ennis	Ellis.
Long, Newt	Santa Anna	Coleman.
Lott, M. K.	Cameron	Milam.
Lumpkin, A. F.	Meridian	Bosque.
Luttrell, J. M.	Mineral Wells	Palo Pinto.
McCaleb, G. W.	Gonzales	Gonzales.
McCelvey, J. S.	Temple	Bell.
McClendon, E. F.	Galveston	Galveston.
McCracken, J. H.	Mineral Wells	Palo Pinto.
McCuistion, L. P.	Paris	Lamar.
McDaniel, A. C.	San Antonio	Bexar.
McDaniel, A. S.	San Antonio	Bexar.
McDaniel, Ralph	Granger	Williamson.
McGee, J. A.	Rice	Navarro.
McGee, Wm. J.	Groveton	Trinity.
McGregor, W. W.	Laredo	Webb.
McKnight, W. B.	Mansfield	Tarrant.
McLaughlin, J. W.	Galveston	Galveston.
McNeill, W. T.	Valley Mills	Bosque.
McReynolds, Jno. O.	Dallas	Dallas.
Mahan, L. L.	Hempstead	Waller.
Maner, F. B.	Itasca	Hill.
Maner, W. H.	Blum	Hill.
Manning, E. R.	Albany	Shackelford.
Marberry, A. J.	San Angelo	Tom Green.
Marchman, O. M.	Grand Saline	Van Zandt.
Mellish, E. J.	El Paso	El Paso.
Meyer, Joe	Paris	Lamar.
Miller, Felix P.	Midland	Midland.
Miller, J. W.	Hillsboro	Hill.
Miller, R. F.	Sherman	Grayson.

Name.	Postoffice.	County.
Miller, T. A.	Corsicana	Navarro.
Milliken, S. E.	Dallas	Dallas.
Mincey, J. N.	Mineral Wells	Palo Pinto.
Monday, W. H.	Terrell	Kaufman.
Moody, G. H.	San Antonio	Bexar.
Moor, H. P.	Alvin	Brazoria.
Moore, J. H.	San Antonio	Bexar.
Moore, J. T.	Galveston	Galveston.
Moore, T. W.	La Grange	Fayette.
Moore, W. Claude	Runge	Karnes.
Moore, W. M.	Paris	Lamar.
Morris, Jno. E.	Madisonville	Madison.
Morris, R. T.	Houston	Harris.
Morris, S. M.	Galveston	Galveston.
Moseley, J. A. R.	Jefferson	Marion.
Moss, R. E.	San Antonio	Bexar.
Mullen, J. A.	Houston	Harris.
Nail, Wm. R.	Crawford	McLennan.
Neathery, E. J.	Sherman	Grayson.
Neely, W. H.	Terrell	Kaufman.
Newland, W. B.	Gatesville	Coryell.
Nichols, J. R.	Terrell	Kaufman.
Nicholson, R. E.	Chappell Hill	Washington.
Nicks, J. M.	Stone City	Van Zandt.
Nixon, J. W.	Gonzales	Gonzales.
Norris, F. O.	Eagle Lake	Colorado.
Norsworthy, O. L.	Houston	Harris.
Nott, T. H.	Goliad	Goliad.
Nowlin, Bethel	Jonah	Williamson.
Oates, T. F.	Mexia	Limestone.
O'Barr, J. T.	Ledbetter	Fayette.
Osborn, J. D.	Cleburne	Johnson.
Paine, J. F. Y.	Galveston	Galveston.
Pannell, J. A.	Martindale	Caldwell.
Paschal, Frank	San Antonio	Bexar.
Patton, W. D.	Van Alstyne	Grayson.
Pennington, W. H.	Justin	Denton.
Person, A. G.	Snyder	Scurry.
Peters, Otto K.	Galveston	Galveston.
Pickett, W. S.	Karnes City	Karnes.
Pier, T. J.	Brenham	Washington.

Name.	Postoffice.	County.
Pollard, W. J.	Kaufman	Kaufman.
Pool, M. M.	El Campo	Wharton.
Pope, Irwin	Tyler	Smith.
Pope, J. G.	Coleman	Coleman.
Powell, J. H. E.	Smithville	Bastrop.
Powell, W. P.	Willis	Montgomery.
Preston, John	Abilene	Taylor.
Price, J. S.	Beaumont	Jefferson.
Price, Sterling	Jacksonville	Cherokee.
Pullen, W. B.	Jacksonville	Cherokee.
Raines, C. B.	Mineral Wells	Palo Pinto.
Ralston, Joseph C.	Galveston	Galveston.
Randall, Edward	Galveston	Galveston.
Rape, Thos. A.	Ballinger	Runnels.
Rape, W. A.	Victoria	Victoria.
Rawlings, J. A.	El Paso	El Paso.
Ray, D. M.	Whitewright	Grayson.
Raysor, P. M.	Bryan	Brazos.
Red, S. C.	Houston	Harris.
Redmond, Henry	Corpus Christi	Nueces.
Reed, V. E. H.	Holland	Bell.
Reuss, J. H.	Cuero	DeWitt.
Rice, S. P.	Marlin	Falls.
Robert, J. J.	Hillsboro	Hill.
Rogers, W. L.	Houston	Harris.
Ross, A. A.	Lockhart	Caldwell.
Russ, W. B.	San Antonio	Bexar.
Rosser, C. M.	Dallas	Dallas.
Sartor, E. R.	Baird	Callahan.
Saunders, Bacon	Fort Worth	Tarrant.
Scarbrough, A. O.	Snyder	Scurry.
Schramm, C. J.	Fayetteville	Fayette.
Scott, A. C.	Temple	Bell.
Scott, J. W.	Houston	Harris.
Self, T. N.	Cleburne	Johnson.
Sellers, C. B.	Comanche	Comanche.
Sessions, E. L.	Hillsboro	Hill.
Sessions, I. P.	Rockdale	Milam.
Shapard, R. R.	Anson	Jones.
Shaw, E. M.	Victoria	Victoria.
Shearer, T. W.	Wallisville	Chambers.
Shell, W. T.	Corsicana	Navarro.

Name.	Postoffice.	County.
Shelmire, J. B.	Dallas	Dallas.
Shields, F. B.	Victoria	Victoria.
Shropshire, W.	Yoakum	DeWitt.
Shultz, C. A.	Alvarado	Johnson.
Simmons, C. B.	Decatur	Wise.
Slater, Thos. J.	Re	Navarro.
Smith, A. J.	Galveston	Galveston.
Smith, C. A.	Tyler	Smith.
Smith, M.	Sulphur Springs	Hopkins.
Smith, M. M.	Austin	Travis.
Smoot, J. B.	Dallas	Dallas.
Spohn, A. E.	Corpus Christi	Nueces.
Spring, Jno. V.	San Antonio	Bexar.
Starley, W. F.	Mexia	Limestone.
Stern, D. Y.	Slidell	Wise.
Stinson, J. B.	Sherman	Grayson.
Stokes, E. B.	Crockett	Houston.
Stuart, J. R.	Houston	Harris.
Suttle, I. N.	Corsicana	Navarro.
Swain, W. C.	Cuero	DeWitt.
Tabor, Geo. R.	Austin	Travis.
Tainter, L. K.	Kerrville	Kerr.
Taylor, Holman	Marshall	Harrison.
Taylor, J. F.	Briggs	Burnet.
Terrell, S. L.	Dallas	Dallas.
Terrell, W. M.	Graham	Young.
Terry, J. S.	Ennis	Ellis.
Thomas, E. M.	Georgetown	Williamson.
Thomas, G. T.	Rogers	Bell.
Thomason, Jno. W.	Huntsville	Walker.
Thompson, F. D.	Fort Worth	Tarrant.
Thompson, J. E.	Galveston	Galveston.
Thompson, W. R.	Fort Worth	Tarrant.
Thompson, W. R. P.	Smithville	Bastrop.
Thurston, D. M.	Beeville	Bee.
Townes, J. M.	Joshua	Johnson.
Trueheart, C. W.	Galveston	Galveston.
Turner, Jno. S.	Terrell	Kaufman.
Turner, S. T.	El Paso	El Paso.
Tutwiler, H. A.	Flatonia	Fayette.
Van Nuys, J. C.	Franklin	Robertson.
Wagley, T. J.	Cleburne	Johnson.

Name.	Postoffice.	County.
Warfield, C.	San Antonio.	Bexar.
Watkins, W. A.	Kemp	Kaufman.
Watters, E. A.	Fort Worth.	Tarrant.
Weaver, T. P.	DeLeon	Comanche.
Webster, H. R.	Texarkana	Bowie.
Weems, M. A.	Columbia	Brazoria.
Weems, M. L., Jr.	Brazoria	Brazoria.
West, H. A.	Galveston	Galveston.
West, W. F.	Waxahachie	Ellis.
Westbrook, W. J.	Sipe Springs	Comanche.
White, R. R.	Temple	Bell.
Whitehead, T. C.	Del Rio	Val Verde.
Wier, R. R.	Itasca	Hill.
Wilkinson, C. H.	Comfort	Kendall.
Willburn, D. Y.	Runge	Karnes.
Williams, Chas. B.	Mineral Wells	Palo Pinto.
Williams, Dee	Anson	Jones.
Williamson, A. C.	Kerens	Navarro.
Williamson, Jno. A.	Mineral Wells	Palo Pinto.
Wilson, J. E.	Terrell	Kaufman.
Wilson, J. T.	Sherman	Grayson.
Wilson, R. A.	Odessa	Ector.
Wilson, T. M.	Thornton	Limestone.
Witte, B. E.	Shelby	Austin.
Witt, J. M.	Bartlett	Williamson.
Wolf, W. M.	San Antonio.	Bexar.
Wolff, A. S.	Brownsville	Brown.
Wood, W. A.	Hubbard	Hill.
Wooten, Jos. S.	Austin	Travis.
Wooters, J. S.	Crockett	Houston.
Worsham, B. M.	Austin	Travis.
Wright, M. A.	El Paso.	El Paso.
Yates, J. D.	Kirbyville	Jasper.
Yeager, C. F.	Mineral Wells	Palo Pinto.
York, J. B.	Houston	Harris.
Young, F. E.	San Antonio.	Bexar.
Zvesper, J. S.	Ammonsville	Fayette.

OFFICERS OF THE TEXAS STATE MEDICAL HOUSTON, TEXAS,

Session.	Date of Meeting.	Place of Meeting.	Presidents.	First Vice Presidents.
1	June, 1869	Houston	T. J. Heard	R. H. Jones
2	June, 1870	Houston	R. H. Jones	R. W. Lundy
3	June, 1871	Houston	D. R. Wallace	L. Hundspeth
4	June, 1872	Houston	R. T. Flewellen	J. A. McQueen
5	April, 1873	Waco	D. F. Stuart	H. W. Brown
6	April, 1874	Dallas	A. G. Clopton	T. D. Wooten
7	April, 1875	Austin	H. W. Brown	L. R. Mayfield
8	April, 1876	Marshall	R. H. Harrison	John H. Pope
9	April, 1877	Galveston	W. D. Kelly	Geo. Cupples
10	April, 1878	San Antonio	Geo. Cupples	R. W. White
11	April, 1879	Sherman	John H. Pope	S. F. Matchett
12	April, 1880	Brenham	A. R. Kilpatrick	R. M. Swearingen
13	April, 1881	Waco	Ashbel Smith	S. F. Starley
14	April, 1882	Fort Worth	S. F. Starley	W. P. Burts
15	April, 1883	Tyler	A. P. Brown	T. H. Nott
16	April, 1884	Belton	H. C. Ghent	E. P. Becton
17	April, 1885	Houston	E. P. Becton	R. Rutherford
18	April, 1886	Dallas	T. H. Nott	R. H. Chilton
19	April, 1887	Austin	S. R. Burroughs	R. T. Knox
20	April, 1888	Galveston	J. F. Y. Paine	H. K. Leake
21	April, 1889	San Antonio	R. M. Swearingen	A. Sims
22	April, 1890	Fort Worth	W. P. Burts	J. C. J. King
23	April, 1891	Waco	W. H. Wilkes	P. C. Coleman
24	April, 1892	Tyler	J. D. Osborn	T. J. Bell
25	April, 1893	Galveston	J. H. Sears	C. M. Rosser
26	April, 1894	Austin	J. W. McLaughlin	W. L. York
27	April, 1895	Dallas	P. C. Coleman	J. T. Wagley
28	April, 1896	Fort Worth	J. C. Loggins	A. N. Denton
29	April, 1897	Paris	Bacon Saunders	S. C. Red
30	April, 1898	Houston	J. T. Wilson	J. M. Fort
31	April, 1899	San Antonio	A. B. Gardner	B. E. Hadra
32	April, 1900	Waco	B. E. Hadra	Taylor Hudson
33	April, 1901	Galveston	Taylor Hudson	S. C. Red
34	May, 1902	Dallas	S. C. Red	J. E. Thompson
35	April, 1903	San Antonio	Frank Paschal	F. E. Daniel

* Died July, 1886, and F. E. Daniel was appointed till next meeting.

ASSOCIATION SINCE ITS ORGANIZATION AT JUNE 16, 1869.

SECOND VICE PRESIDENTS.	THIRD VICE PRESIDENTS.	SECRETARIES.	TREASURERS.
D. W. Wallace		A. Connell	F. Hassenberg.
W. J. Locke		A. Connell	W. P. Biddell.
J. T. Norris		A. Connell	W. P. Biddell.
D. F. Stuart		A. Connell	J. Larendon.
J. M. Morrison		S. O. Young	J. Larendon.
M. H. Oliver		W. A. East	J. Larendon.
M. A. Taylor	R. H. Harrison	W. A. East	J. Larendon.
T. W. Wylie	W. H. Park	W. A. East	J. Larendon.
R. M. Swearingen	J. H. Sears	W. A. East	J. Larendon.
W. E. Saunders	J. D. Field	W. A. East	J. Larendon.
S. F. Starley	S. Eagon	W. A. East	J. Larendon.
E. J. Beall	O. H. Seeds	R. H. L. Bibb	J. Larendon.
J. W. McLaughlin	J. A. Summers	R. H. L. Bibb	J. Larendon.
W. A. Adams	Joe. S. Willis	W. J. Burt	J. Larendon.
J. D. Osborn	Frank Allen	W. J. Burt	J. Larendon.
H. H. Darr	M. Martin	W. J. Burt	J. Larendon.
John C. Jones	S. R. Burroughs	W. J. Burt	J. Larendon.
J. C. Loggins	H. L. Parsons	W. J. Burt*	J. Larendon.
A. M. Douglass	A. A. Terhune	F. E. Daniel	J. Larendon.
A. V. Doak	O. Eastland	F. E. Daniel	J. Larendon.
B. F. Kingsley	I. E. Clark	F. E. Daniel	J. Larendon.
M. D. Knox	W. W. Reeves	F. E. Daniel	J. Larendon.
W. L. Rogers	B. H. Vaughn	H. A. West	J. Larendon.
F. W. Pitts, Jr	T. J. Bennett	H. A. West	J. Larendon.
E. M. Rabb	W. A. Watkins	H. A. West	J. Larendon.
W. R. Blallock	W. H. Lancaster	H. A. West	J. Larendon.
N. B. Kennedy	T. B. Bass	H. A. West	J. Larendon.
J. S. Letcher	David Cerna	H. A. West	J. Larendon.
A. C. Scott	C. M. Alexander	H. A. West	J. Larendon.
Taylor Hudson	R. W. Knox	H. A. West	J. Larendon.
Geo. H. Lee	F. D. Thompson	H. A. West	R. F. Miller.
L. Ashton	S. T. Turner	H. A. West	R. F. Miller.
J. W. Nixon	W. A. Watkins	H. A. West	R. F. Miller.
J. E. Gilcreest	H. K. Leake	H. A. West	R. F. Miller.
A. L. Hathcock	Joe Becton	H. A. West	R. F. Miller.

COUNTY SOCIETIES ORGANIZED UNDER THE NEW CONSTITUTION AND BY-LAWS, ADOPTED AT SAN ANTONIO, FROM MAY 1, TO OCTOBER 1, 1903.

COUNTY.	PRESIDENT.	SECRETARY.	MEMBERS
Johnson	W. P. Alexander, Cleburne	J. M. Huddleston, Cleburne	20
Hunt	W. C. Welch, Caddo Mills	M. L. Moody, Greenville	30
Dallas	V. P. Armstrong, Dallas	Elbert Dunlap, Dallas	70
Ellis	J. C. Loggins, Ennis	S. C. Gage, Ennis	41
Galveston	C. W. Trueheart, Galveston	J. C. Ralston, Galveston	30
Jefferson	W. W. Cunningham, Beaumont.	Guy Reed, Beaumont	18
Palo Pinto	J. H. McCracken, Mineral Wells.	C. B. Williams, Mineral Wells.	13
Wilbarger	J. E. Dodson, Vernon	J. B. Farrington, Vernon	7
Jackson	J. M. Richmond, Edna	O. K. Radkey, Edna	5
Hopkins	A. B. Longino, Sulphur Springs.	W. R. Shook, Brashear	8
Jasper / Newton	H. R. Hancock, Jasper	T. E. Stone, Jasper	6
Harrison	J. F. Rosborough, Marshall	M. H. Wheat, Marshall	25
Van Zandt	J. M. Fry, Wills Point	O. M. Marchman, Grand Saline	—
Tarrant	I. L. Van Zandt, Fort Worth	L. A. Barber, Fort Worth	32
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PRINCIPLES OF MEDICAL ETHICS.

PREFACE.

At the annual meeting of the American Medical Association, held in New Orleans, the House of Delegates unanimously adopted, on May 7, 1903, the "Principles of Medical Ethics" recommended by its committee, and ordered that the following extract from the report of the Special Committee on Revision of the Code of Medical Ethics be printed as an explanatory preface to these "principles":

"The caption 'Principles of Medical Ethics' has been substituted for 'Code of Medical Ethics.' Inasmuch as the American Medical Association may be conceived to hold a relation to the constituent State associations analogous to that of the United States through its constitution to the several States, the committee deemed it wiser to formulate the principles of medical ethics without definite reference to code or penalties. Large discretionary powers are thus left to the respective State and Territorial societies to form such codes and establish such rules for the professional conduct of their members as they may consider proper, provided, of course, that there shall be no infringement of the established ethical principles of this Association."

The American Medical Association promulgates as a suggestive and advisory document the following:

CHAPTER I.

THE DUTIES OF PHYSICIANS TO THEIR PATIENTS.

The Physician's Responsibility.

SECTION 1. Physicians should not only be ever ready to obey the calls of the sick and the injured, but should be mindful of the high character of their mission and of the responsibilities they must incur in the discharge of momentous duties. In their ministrations they should never forget that the comfort, the health and the lives of those entrusted to their care depend on skill, attention and fidelity. In deportment they should unite tenderness, cheerfulness and firmness, and thus inspire all sufferers with gratitude, respect and confidence. These observances are the more sacred

because, generally, the only tribunal to adjudge penalties for unkindness, carelessness or neglect is their own conscience.

Humanity, Delicacy and Secrecy Needed.

SEC. 2. Every patient committed to the charge of a physician should be treated with attention and humanity, and reasonable indulgence should be granted to the caprices of the sick. Secrecy and delicacy should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted, in their professional visits, should be guarded with the most scrupulous fidelity and honor.

Secrecy to be Inviolate.

SEC. 3. The obligation of secrecy extends beyond the period of professional services; none of the privacies of individual or domestic life, no infirmity of disposition or flaw of character observed during medical attendance, should ever be divulged by physicians, except when imperatively required by the laws of the State. The force of the obligation of secrecy is so great that physicians have been protected in its observance by courts of justice.

Frequency of Visits.

SEC. 4. Frequent visits to the sick are often requisite, since they enable the physician to arrive at a more perfect knowledge of the disease, and to meet promptly every change which may occur. Unnecessary visits are to be avoided, as they give undue anxiety to the patient; but to secure the patient against irritating suspense and disappointment the regular and periodical visits of the physician should be made as nearly as possible at the hour when they may be reasonably expected by the patient.

Honesty and Wisdom in Prognosis.

SEC. 5. Ordinarily, the physician should not be forward to make gloomy prognostications, but should not fail, on proper occasions, to give timely notice of dangerous manifestations to the friends of the patient; and even to the patient, if absolutely necessary. This notice, however, is at times so peculiarly alarming when given by the physician, that its deliverance may often be preferably assigned to another person of good judgment.

Encouragement of Patients.

SEC. 6. The physician should be a minister of hope and comfort to the sick, since life may be lengthened or shortened not only by the acts, but by the words or manner of the physician, whose solemn duty is to avoid all utterances and actions having a tendency to discourage and depress the patient.

Incurable Cases Not to Be Neglected.

SEC. 7. The medical attendant ought not to abandon a patient because deemed incurable; for continued attention may be highly useful to the sufferer and comforting to the relatives, even in the last period of the fatal malady, by alleviating pain and by soothing mental anguish.

Judicious Counsel to Patients.

SEC. 8. The opportunity which a physician has of promoting and strengthening the good resolutions of patients suffering under the consequences of evil conduct ought never to be neglected. Good counsels, or even remonstrances, will give satisfaction, not offense, if they be tactfully proffered and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

CHAPTER II.

THE DUTIES OF PHYSICIANS TO EACH OTHER AND TO THE PROFESSION AT LARGE.

ARTICLE I. DUTIES FOR THE SUPPORT OF PROFESSIONAL CHARACTER.

Obligation to Maintain Honor of the Profession.

SECTION 1. Everyone on entering the profession, and thereby becoming entitled to full professional fellowship, incurs an obligation to uphold its dignity and honor, to exalt its standing and to extend the bounds of its usefulness. It is inconsistent with the principles of medical science and it is incompatible with honorable standing in the profession for physicians to designate their practice as based on an exclusive dogma or a sectarian system of medicine.

Observation of Professional Rules.

SEC. 2. The physician should observe strictly such laws as are instituted for the government of the members of the profession; should honor the fraternity as a body; should endeavor to promote the science and art of medicine and should entertain a due respect for those seniors who, by their labors, have contributed to its advancement.

Duty to Join Medical Organization.

SEC. 3. Every physician should identify himself with the organized body of his profession as represented in the community in which he resides. The organization of local or county medical societies, where they do not

exist, should be effected, as far as practicable. Such county societies, constituting as they do the chief element of strength in the organization of the profession, should have the active support of their members and should be made instruments for the cultivation of fellowship, for the exchange of professional experience, for the advancement of medical knowledge, for the maintnance of ethical standards, and for the promotion in general of the interests of the profession and the welfare of the public.

County Societies to Affiliate with Higher Organizations.

SEC. 4. All county medical societies thus organized ought to place themselves in affiliation with their respective State associations, and these, in turn, with the American Medical Association.

Purity of Character and Morality Required.

SEC. 5. There is no profession from the members of which greater purity of character and a higher standard of moral excellence are required than the medical; and to attain such eminence is a duty every physician owes alike to the profession and to patients. It is due to the patients, as without it their respect and confidence can not be commanded; and to the profession, because no scientific attainments can compensate for the want of correct moral principles.

Temperance in all Things.

SEC. 6. It is incumbent on physicians to be temperate in all things, for the practice of medicine requires the unremitting exercise of a clear and vigorous understanding; and in emergencies—for which no physician should be unprepared—a steady hand, an acute eye and an unclouded mind are essential to the welfare and even to the life of a human being.

Advertising Methods to be Avoided.

SEC. 7. It is incompatible with honorable standing in the profession to resort to public advertisement or private cards inviting the attention of persons affected with particular diseases; to promise radical cures; to publish cases or operations in the daily prints, or to suffer such publications to be made; to invite laymen (other than relatives who may desire to be at hand) to be present at operations; to boast of cures and remedies; to adduce certificates of skill and success, or to employ any of the other methods of charlatans.

Patents and Secret Nostrums.

SEC. 8. It is equally derogatory to professional character for physicians to hold patents for any surgical instruments or medicines; to accept rebates on prescriptions or surgical appliances; to assist unqualified persons to

evade legal restrictions governing the practice of medicine; or to dispense, or promote the use of, secret medicines, for if such nostrums are of real efficacy, any concealment regarding them is inconsistent with beneficence and professional liberality, and if mystery alone give them public notoriety, such craft implies either disgraceful ignorance or fraudulent avarice. It is highly reprehensible for physicians to give certificates attesting the efficacy of secret medicines, or other substances used therapeutically.

ARTICLE II. PROFESSIONAL SERVICES OF PHYSICIANS TO EACH OTHER.

Physicians Dependent on Each Other.

SECTION 1. Physicians should not, as a general rule, undertake the treatment of themselves, nor of members of their family. In such circumstances they are peculiarly dependent on each other; therefore, kind offices and professional aid should always be cheerfully and gratuitously afforded. These visits ought not, however, be obstrusively made, as they may give rise to embarrassment or interfere with that free choice on which such confidence depends.

Gratuitous Services to Fellow Physicians.

SEC. 2. All practicing physicians and their immediate family dependants are entitled to the gratuitous services of any one or more of the physicians residing near them.

Compensation for Expenses.

SEC. 3. When a physician is summoned from a distance to the bedside of a colleague in easy financal circumstances, a compensation, proportionate to traveling expenses and to the pecuniary loss entailed by absence from the accustomed field of professional labor, should be made by the patient or relatives.

One Physician to Take Charge.

SEC. 4. When more than one physician is attending another, one of the number should take charge of the case, otherwise the concert of thought and action so essential to wise treatment can not be assured.

Attention to Absent Physician's Patients.

SEC. 5. The affairs of life, the pursuit of health and the various accidents and contingencies to which a physician is peculiarly exposed sometimes require the temporary withdrawal of this physician from daily professional labor and the appointment of a colleague to act for a specified time. The colleague's compliance is an act of courtesy which should always

be performed with the utmost consideration for the interest and character of the family physician.

ARTICLE III. THE DUTIES OF PHYSICIANS IN REGARD TO CONSULTATIONS.

The Broadest Humanity in Emergencies Required.

SECTION 1. The broadest dictates of humanity should be obeyed by physicians whenever and wherever their services are needed to meet the emergencies of disease or accident.

Consultations Should Be Promoted.

SEC. 2. Consultations should be promoted in difficult cases, as they contribute to confidence and more enlarged views of practice.

Punctuality in Consultations.

SEC. 3. The utmost punctuality should be observed in the visits of physicians when they are to hold consultations, and this is generally practicable, for society has been so considerate as to allow the plea for a professional engagement to take precedence over all others.

Necessary Delays.

SEC. 4. As professional engagements may sometimes cause delay in attendance, the physician who first arrives should wait for a reasonable time, after which the consultation should be considered as postponed to a new appointment.

Good Feeling and Candor in Consultations.

SEC. 5. In consultations no insincerity, rivalry or envy should be indulged; candor, probity and all due respect should be observed toward the physician in charge of the case.

Unauthorized Statements or Discussions.

SEC. 6. No statement or discussion of the case should take place before the patient or friends, except in the presence of all the physicians attending, or by their common consent; and no opinions or prognostications should be delivered which are not the result of previous deliberation and concurrence.

Attending Physician May Vary Treatment.

SEC. 7. No decision should restrain the attending physician from making such subsequent variations in the mode of treatment as any unexpected change in the character of the case may demand. But at the next consul-

tation reasons for the variations should be stated. The same privilege, with its obligation, belongs to the consultant when sent for in an emergency during the absence of the family physician.

Attending Physician to Prescribe.

SEC. 8. The attending physician, at any time, may prescribe for the patient; not so the consultant, when alone, except in a case of emergency or when called from a considerable distance. In the first instance the consultant should do what is needed and in the second should do no more than make an examination of the patient and leave a written opinion, under seal, to be delivered to the attending physician.

Discussions in Consultation Confidential.

SEC. 9. All discussions in consultation should be held as confidential. Neither by words nor by manner should any of the participants in a consultation assert or intimate that any part of the treatment pursued did not receive his assent.

Conflicts of Opinion.

SEC. 10. It may happen that two physicians can not agree in their views of the nature of a case and of the treatment to be pursued. In the event of such disagreement a third physician should, if practicable, be called in. None but the rarest and most exceptional circumstances would justify the consultant in taking charge of the case. He should not do so merely on the solicitation of the patient or friends.

Consultant to Scrupulously Regard Rights of Attending Physician.

SEC. 11. A physician who is called in consultation should observe the most honorable and scrupulous regard for the character and standing of the attending physician, whose conduct of the case should be justified, as far as can be, consistently with a conscientious regard for truth, and no hint or insinuation should be thrown out which would impair the confidence reposed in the attending physician.

ARTICLE IV. DUTIES OF PHYSICIANS IN CASES OF INTERFERENCE.

Qualifications the Only Basis of Practice.

SECTION 1. Medicine being a liberal profession, those admitted to its ranks should found their expectations of practice especially on the character and the extent of their medical education.

Intercourse with Patients of Other Physicians.

SEC. 2. The physician, in his intercourse with a patient under the care of another physician, should observe the strictest caution and reserve; should give no disingenuous hints relative to the nature and treatment of the patient's disorder, nor should the course of conduct of the physician, directly or indirectly, tend to diminish the trust reposed in the attending physician.

Circumspection as Regards Visits.

SEC. 3. The same circumspection should be observed when, from motives of business or friendship, a physician is prompted to visit a person who is under the direction of another physician. Indeed, such visits should be avoided, except under peculiar circumstances; and when they are made, no inquiries should be instituted relative to the nature of the disease, or the remedies employed, but the topics of conversation should be as foreign to the case as circumstances will admit.

Duty as to Calls to Patients of Other Physicians.

SEC. 4. A physician ought not to take charge of, or prescribe for, a patient who has recently been under the care of another physician, in the same illness, except in case of a sudden emergency, or in consultation with th physician previously in attendance, or when that physician has relinquished the case or has been dismissed in due form.

Criticisms to be Avoided.

SEC. 5. The physician acting in conformity with the preceding section should not make damaging insinuations regarding the practice adopted, and, indeed, should justify it if consistent with truth and probity; for it often happens that patients become dissatisfied when they are not immediately relieved, and, as many diseases are naturally protracted, the seeming want of success, in the first stage of treatment, affords no evidence of a lack of professional knowledge or skill.

Emergency Cases.

SEC. 6. When a physician is called to an urgent case, because the family attendant is not at hand, unless assistance in consultation is desired, the former should resign the care of the patient immediately on the arrival of the family physician.

Duty When Called with Other Physicians.

SEC. 7. It often happens, in cases of sudden illness, and of accidents and injuries, owing to the alarm and anxiety of friends, that several physi-

cians are simultaneously summoned. Under these circumstances, courtesy should assign the patient to the first who arrives, and who, if necessary, may invoke the aid of some of those present. In such case, however, the acting physician should request that the family physician be called, and should withdraw unless requested to continue in attendance.

Case to be Relinquished to Regular Attendant.

SEC. 8. Whenever a physician is called to the patient of another physician during the enforced absence of that physician the case should be relinquished on the return of the latter.

Emergency Attention and Advice.

SEC. 9. A physician, while visiting a sick person in the country, may be asked to see another physician's patient because of a sudden aggravation of the disease. On such an occasion the immediate needs of the patient should be attended to and the case relinquished on the arrival of the attending physician.

Substitute Obstetric Work.

SEC. 10. When a physician who has been engaged to attend an obsteric case is absent and another is sent for, delivery being accomplished during the vicarious attendance, the acting physician is entitled to the professional fee, but must resign the patient on the arrival of the physician first engaged.

ARTICLE V. DIFFERENCES BETWEEN PHYSICIANS.

Arbitration of Differences.

SECTION 1. Diversity of opinion and opposition of interest may, in the medical as in other professions, sometimes occasion controversy and even contention. Whenever such unfortunate cases occur and can not be immediately adjusted, they should be referred to the arbitration of a sufficient number of impartial physicians.

Reserve Toward Public on Certain Professional Questions.

SEC. 2. A peculiar reserve must be maintained by physicians toward the public in regard to some professional questions, and as there exist many points in medical ethics and etiquette through which the feelings of physicians may be painfully assailed in their intercourse, and which can not be understood or appreciated by general society, neither the subject matter of their differences nor the adjudication of the arbitration should be made public.

ARTICLE VI. COMPENSATION.

The Limits of Gratuitous Service.

SECTION 1. By the members of no profession are eleemosynary services more liberally dispensed than by the medical, but justice requires that some limits should be placed to their performance. Poverty, mutual professional obligations, and certain of the public duties named in Sections 1 and 2, of Chapter III, should always be recognized as presenting valid claims for gratuitous services; but neither institutions endowed by the public or the rich, or by societies for mutual benefit, for life insurance, or for analogous purposes, nor any profession or occupation, can be admitted to possess such privilege.

Certifying or Testifying to be Paid For.

SEC. 2. It can not be justly expected of physicians to furnish certificates of inability to serve on juries, or to perform militia duty; to testify to the state of health of persons wishing to insure their lives, obtain pensions, or the like, without due compensation. But to persons in indigent circumstances such services should always be cheerfully and freely accorded.

Fee Bills.

SEC. 3. Some general rules should be adopted by the physicians in every town or district relative to the minimum pecuniary acknowledgment from their patients; and it should be deemed a point of honor to adhere to these rules with as much uniformity as varying circumstances will admit.

Giving or Receiving Commissions Condemned.

SEC. 4. It is derogatory to professional character for physicians to pay or offer to pay commissions to any person whatsoever who may recommend to them patients requiring general or special treatment or surgical operations. It is equally derogatory to professional character for physicians to solicit or to receive such commissions.

CHAPTER III.

THE DUTIES OF THE PROFESSION TO THE PUBLIC.

Duties as to Public Hygiene, Etc.

SECTION 1. As good citizens it is the duty of physicians to be very vigilant for the welfare of the community, and to bear their part in sustaining its laws, institutions and burdens; especially should they be ready to co-op-

erate with the proper authorities in the administration and the observance of sanitary laws and regulations, and they should also be ever ready to give counsel to the public in relation to subjects especially appertaining to their profession, as on questions of sanitary police, public hygiene and legal medicine.

Enlightenment of Public on Sanitary Matters. Duties in Epidemics.

SEC. 2. It is the province of physicians to enlighten the public in regard to quarantine regulations; to the location, arrangement and dietaries of hospitals, asylums, schools, prisons and similar institutions; in regard to measures for the prevention of epidemic and contagious diseases; and when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of the suffering people, even at the risk of their own lives.

Physicians as Witnesses.

SEC. 3. Physicians, when called on by legally constituted authorities, should always be ready to enlighten inquests and courts of justice on subjects strictly medical, such as involve questions relating to sanity, legitimacy, murder by poison or other violent means, and various other subjects embraced in the science of medical jurisprudence. It is but just, however, for them to expect due compensation for their services.

Enlightenment of the Public as to Charlatans.

SEC. 4. It is the duty of physicians who are frequent witnesses of the great wrongs committed by charlatans and of the injury to health and even destruction of life caused by the use of their treatment, to enlighten the public on these subjects and to make known the injuries sustained by the unwary from the devices and pretensions of artful imposters.

Relations to Pharmacists.

SEC. 5. It is the duty of physicians to recognize and by legitimate patronage to promote the profession of pharmacy, on the skill and proficiency of which depends the reliability of remedies, but any pharmacist who, although educated in his own profession, is not a qualified physician, and who assumes to prescribe for the sick, ought not to receive such countenance and support. Any druggist or pharmacist who dispenses deteriorated or sophisticated drugs or who substitutes one remedy for another designated in a prescription ought thereby to forfeit the recognition and influence of physicians.

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